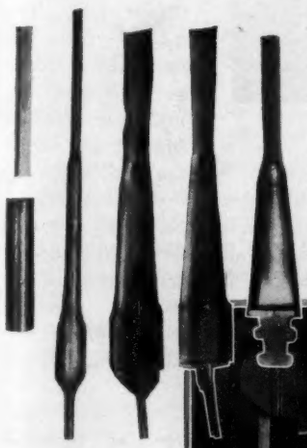
Volume 86
Number 15

IRON TRADE REVIEW

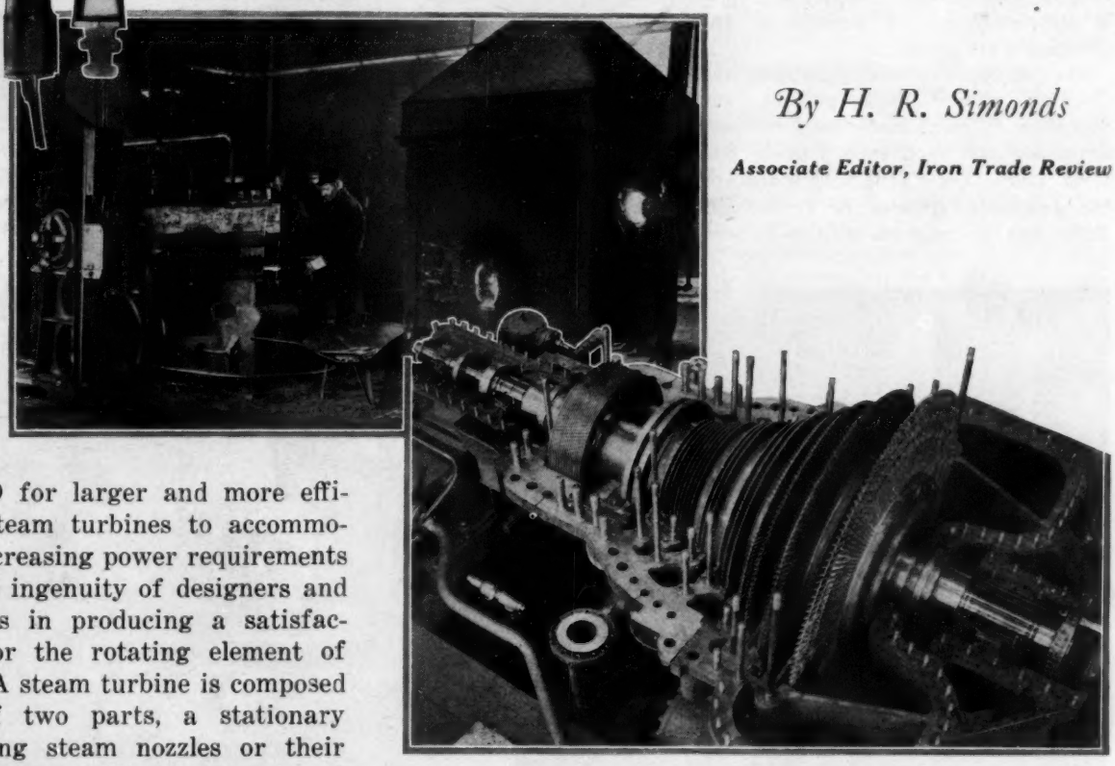
Cleveland, O.
April 10, 1930

Turbine Blades *Offer* New Field *for* Alloy Steels

Corrosion Resisting Feature Essential



STEPS in forming a turbine blade from a steel bar are shown at the left. The first operation is performed on a small forging hammer, shown in the center illustration. Lower right is a typical steam turbine, with cover removed, showing high-pressure and low-pressure blades.



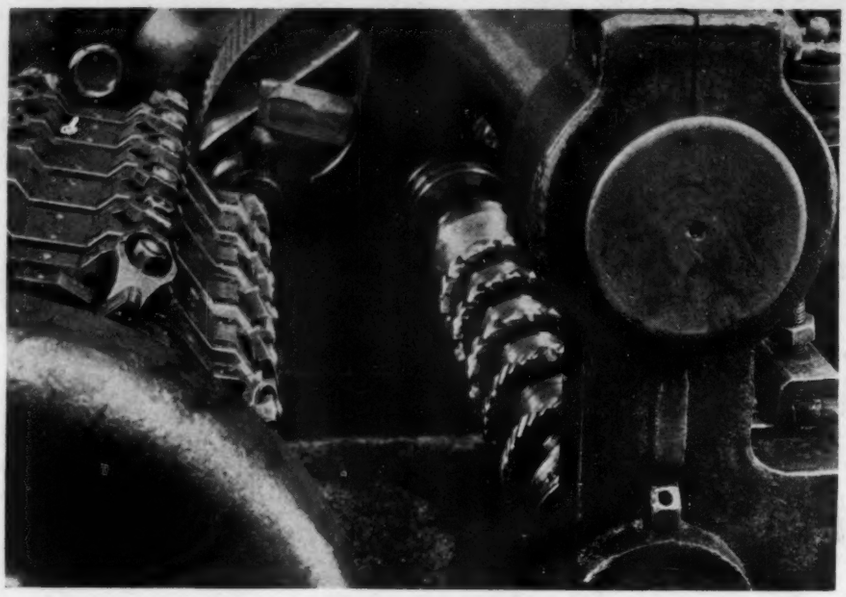
By H. R. Simonds

Associate Editor, Iron Trade Review

DEMAND for larger and more efficient steam turbines to accommodate increasing power requirements has taxed the ingenuity of designers and manufacturers in producing a satisfactory blade for the rotating element of the turbine. A steam turbine is composed essentially of two parts, a stationary part containing steam nozzles or their equivalent and a rotating part equipped with blades. These blades constitute the heart of the turbine but they also constitute the chief construction difficulty in large turbine production. The blades revolve at high speed with relatively small clearances between the moving and stationary parts. Under such conditions a single failure of a blade may cause great havoc. An accompanying illustration shows clearly various sizes of blades mounted on the rotating element of a large steam turbine. In operation these blades are subjected to the erosive and corrosive action of steam at elevated temperature, and therefore they are usually made of corrosion-resisting steels and alloys.

In 1924 the Westinghouse Electric & Mfg. Co. moved its turbine blade manufacturing department from East Pittsburgh to its South Philadelphia works where it occupied a modern, well-arranged set of buildings. The blade shop as now established consists of a 1-story brick and steel

building, 500 feet long and 145 feet wide, joined at one end to a 2-story building 320 feet long and 130 feet wide, thus giving the entire blade shop a floor area of 146,550 square feet. Inasmuch as extensive development work covering materials and manufacturing methods had been carried on at the East Pittsburgh plant, it was possible to design and equip the new plant at Philadelphia for efficient and co-ordinated manufacture. The nature of the equipment and the general procedure in the production of turbine blades will be apparent from a description of the practice at the Westinghouse plant.

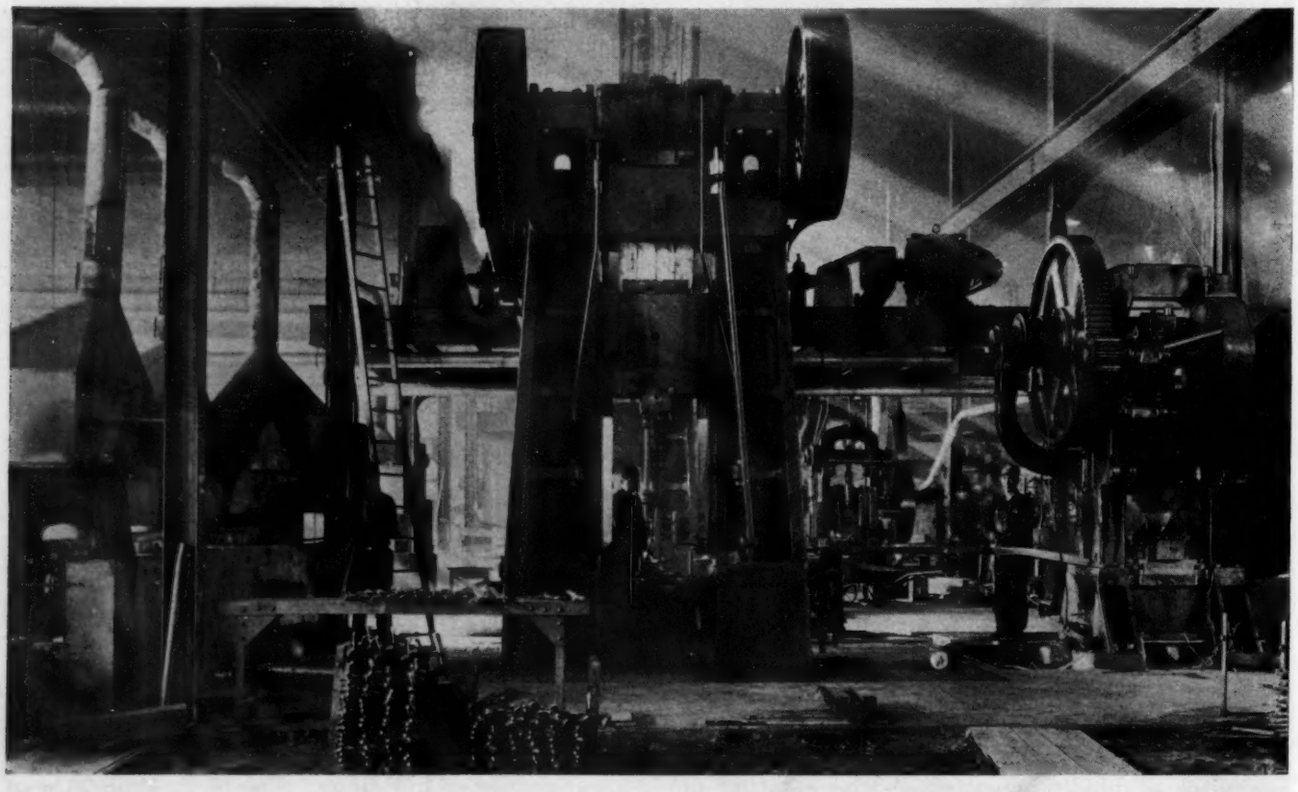


Multiple milling machine being used to notch ends of blades

Service requirements of impulse and reaction blades vary greatly and therefore different materials have been developed for each type. Blade material must have strength to withstand the combined stresses of centrifugal force due to rotation of the spindle, of steam thrust and of vibratory forces set up by the action of the steam jets on the blades. Another necessary requirement is that the tensile strength shall not be unduly diminished by the temperature of the steam under working conditions. Experience has shown that a material tough enough to withstand bending and vibration is more desirable than one having high tensile strength but lacking toughness.

One of the first materials developed for reaction blades was a copper-zinc alloy. This has been succeeded in turn by carbon steel, copperclad steel, phosphor-bronze and manganese-copper. Five per cent nickel steel now is being used successfully for impulse blades. Pure nickel has been used for reaction blades where temperatures are too high for the manganese-copper. Special alloy steels are being used with marked success for certain types of reaction blades and more extensive use of alloy steels for turbine blades is predicted by manufacturers. The manganese-copper most commonly used for reaction blades consists essentially of 5 per cent manganese and approximately 95 per cent copper.

To dampen the tendency to vibrate, groups of blades are tied together with lashing wire. The material used for this wire is pure nickel which has nearly the same coefficient of expan-



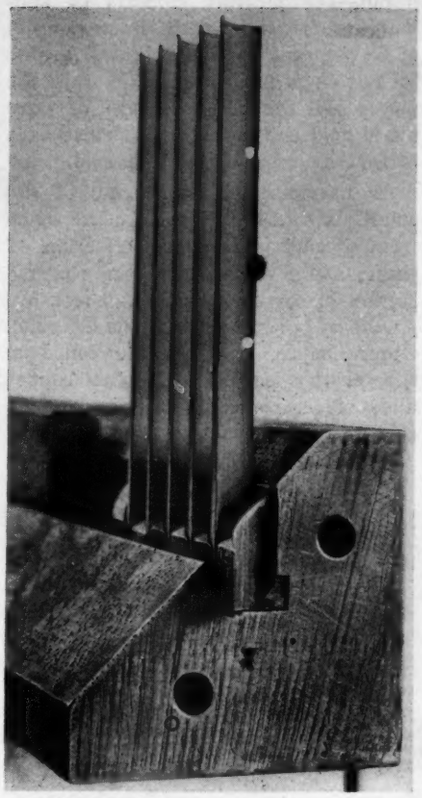
Board drop hammer of 7500-pound capacity, used in forging large blades for turbines. Heating furnaces may be seen at the left, smaller hammers at the right

sion as the steel spindle body, thus reducing to a minimum expansion stresses caused by changes of temperature. One method of fastening the blades to the rotor employs dovetailed packing which locks in an undercut groove. The base of the blade is upset cold in a commercial type of bulldozer machine. The packing pieces are made of soft carbon steel rolled and drawn to section, sheared to length and broached to dovetail. Large stationary blades frequently are cast of manganese bronze in which case the surfaces are ground to the required shape. Many of the large and medium length blades are forged to approximate form in the plant's forge shop.

Forging Processes Systemized

The material for making blades reaches the plant in the form of bars. For the forged blades these bars are either corrosion resisting or 5 per cent nickel steel. The small bars are cut to forging lengths on power shears but all bars 1¾ inches in diameter and over are sawed to length on power saws. The first breakdown is on Bradley-type hammers of which there are three sizes, 100-pound, 200-pound and 500-pound. The blanks to be drawn out on these hammers first are preheated and allowed to soak at 1200 degrees Fahr. They are then transferred from the preheating furnace to a forging furnace where they are heated to 1950 degrees Fahr. for the drawing out operation. The temperature is controlled carefully with pyrometers. This hammering operation is shown in an accompanying illustration. The preheating furnace is in the foreground and the forging furnace is beyond the hammer. The rough forgings are thrown into a wheelbarrow as shown and then are taken to the adjacent board hammer department for the finish forging. Board drop hammer equipment is extensive and includes one hammer of 7500-pound capacity, shown in one of the illustrations and thought to be one of the largest board drop hammers in operation. Each board hammer has one or two forging furnaces located nearby and the process of forging has been carefully worked out on a group-sequence basis, developed to increase forging efficiency. The number of pieces in a particular group for forging depends upon the length of time required to bring a piece which has passed through one operation back to forging heat.

The scheme works as follows: Assume the group of forgings to consist of ten pieces. These are placed in an adjacent furnace and brought up to forging temperature. The operator then takes one of these out and puts



Small blades are cold worked and punched for the lashing wire, as shown

it through the first pass. He then replaces it in the furnace and takes the second piece and continues until all ten have been put through the first operation. By this time his first piece has come up to forging temperature again and is ready to be put through the second operation. It is taken out with no lost time and is forged a second time between the same dies. This process is continued until all the pieces in the group have been brought to finish forge dimensions. This is all done between the same set of dies and the process frequently calls for seven or eight reheats. During the time that this first group is being forged a furnace man has placed a second group in a second furnace and has brought it up to forging temperature. Thus when the first group has been completed, the second group is ready to be started and the furnace man turns his attention to charging the first furnace.

Die Blocks Carefully Treated

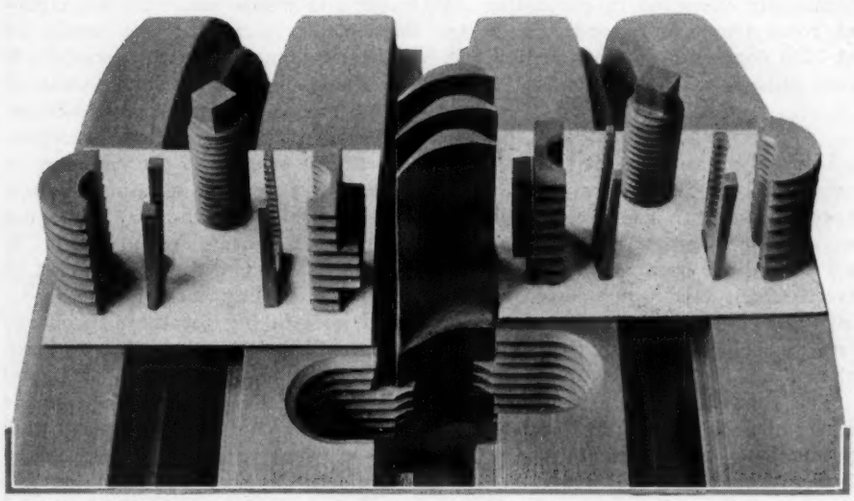
In order to have the die blocks stand up under this severe service the blocks are carefully heat treated. They are usually carbon steel with the carbon content running between 0.80 and 0.90 per cent, phosphorus and sulphur are kept below 0.025 per cent and the manganese is held at about 0.45. The blocks are heated in an electric furnace and forged on all six sides. They are then heated in an open furnace to about 1475 degrees Fahr., after which they are quenched in a deep tank of water provided with submerged sprays to insure rapid and uniform cooling.

The blades also are heat treated carefully. Corrosion resisting steel bars are purchased by analysis and must meet physical tests showing an ultimate tensile strength of 10,000 pounds per square inch, an elastic limit of 70,000 pounds per square inch and an impact figure of 50 foot pounds.

Specifications for this type of steel are approximately as follows:

	Per cent
Carbon	0.07-0.12
Manganese	0.30-0.60
Phosphorus	0.03 maximum
Sulphur	0.03 maximum
Silicon	0.35 maximum
Chromium	11.50-12.50
Nickel	0.60 maximum
Elongation in 2 inches	20
Reduction in area	60

A typical analysis for the nickel



One method of fastening blades into the turbine rotor frame

steel bars is as follows, figures being purchaser's specifications:

	Per cent
Carbon	0.05-0.10
Manganese	0.30-0.50
Silicon	0.10-0.25
Nickel	4.50-5.50
Chromium	0.02 maximum
Sulphur	0.03 maximum

Corrosion-resisting steel bars frequently are heat treated at the steel mill before shipping; however, a further treatment is given after forging. They are first pickled to remove the scale and then inspected. Afterwards they go to the heat treating department where they are heated in a salt bath to 1750 degrees Fahr. It takes about 1 hour for average sized blades to come up to this temperature in the salt bath. The salt used is known as No. 130 Lavite. After heating, the blades are quenched in circulating oil at room temperature and are drawn at 1200 degrees Fahr. in a second salt bath using a solution of No. 110 Lavite.

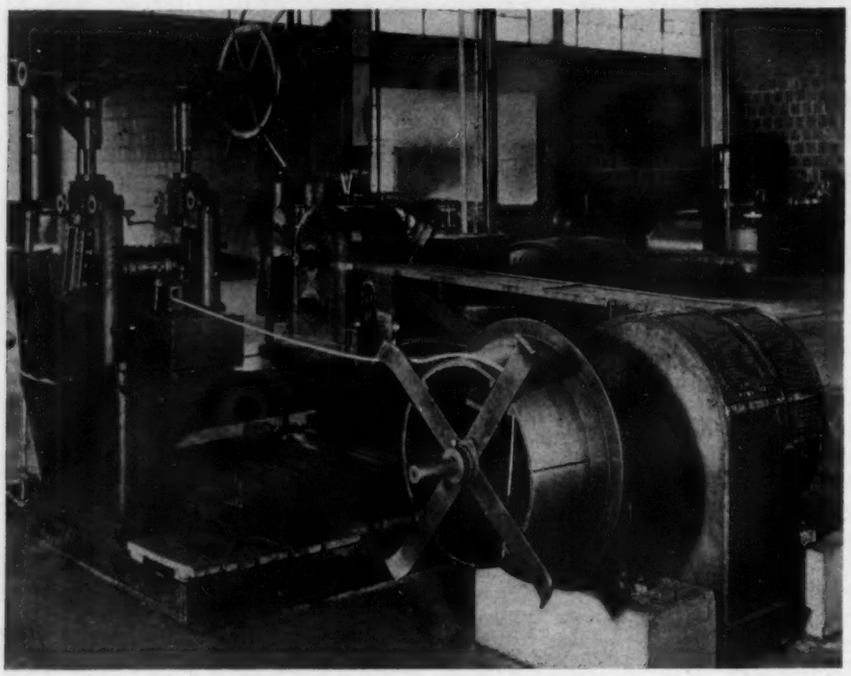
Unusual Precautions Taken

Unusual precautions are taken to prevent the blades from warping during heat treatment. The smaller blades, as mentioned, are not quenched. The air cooling has been found to eliminate much of the tendency to warp. Forgings are heat treated with the flash left on, helping to keep the blades in shape.

The elimination of scale during the early operations is important to the production of satisfactory turbine blades. This is done by repeated pickling operations; frequently the blades in process are pickled between each heat. The pickling consists of submerging for 15 minutes in a solution of 50 per cent hydrochloric acid heated to 140 degrees Fahr. After this the pieces are dipped in a bath of pure nitric acid and rinsed. The rinse bath is for the recovery of the acid.

As previously stated, many of the small sizes of turbine blades are made from specially rolled shapes. Some of these, as in the case of the rhubarb section in corrosion-resisting steel, are purchased direct from steel mills. Other shapes, however, are rolled in the plant. Material for the copper alloy blades comes in coils and is fed cold into draw benches.

Forged blades frequently are tapered and some rolled blades are upset as mentioned. The cold working process which is comparatively simple to watch and which makes for high production, is in reality the result of much experimentation and study. It often happens that the introduction of a new material means a complete revolution in the production processes. One of the officials of the company in commenting on this question of new material said, "when the increasing severity of service requirements in turbine design causes the engineer to seek new blading material, it is no small undertaking for those in charge of the mill and the blade shop to learn the peculiarities of the new material and the pitfalls to be avoided in its composition, furnace treatment and process work throughout the entire manufacturing sequence. Months and even years may be required to develop material of just the right composition, and to work out processes that will conserve the required qualities."



Rolling mill and reel used for special small rolled blade sections

After the blades are formed they go to the machine shop where the bases are milled and outer portions ground. The large number of uniform blades required for standard turbines has made possible the development of highly specialized machine operations. The multiple milling machine, shown in an accompanying illustration, is used for simultaneous notching of six or more blades. Grinding is done to erase forge marks and also to produce a thinner edge than is feasible to produce by forming processes. Blade edges and lashing wire hole edges are rounded by grinding to prevent concentration of stresses.

Blades Specially Tested

After grinding the blades are tested in specially constructed box gages which check the blade cross section at several different points. The larger forged blades frequently are 34 inches long and of special design. The form of the blade may change abruptly at some point midway in its length and the blade may be twisted in relation to its base. This irregular design may be noted from inspection of the illustration which shows the development of a blade from the bar at the left through the forging operations to the finished product at the right. The test boxes for blades of this complicated type naturally are elaborate devices. They are made after the style of a case of shelves with each shelf cut out of the form of the blade at that particular point.

Small blades are drilled after grinding. These holes are to take the lashing wires which bind groups of blades together. The holes are located as close to the edge of the blade as possible so as to cause a minimum reduction of the blade's strength. Two accompanying illustrations show methods of fastening the blades in place on the rotor. When finished the blades are assembled into the complete turbine in the steam turbine plant which adjoins the blade shop.

Arranging Symposium on Aircraft Materials

A symposium on "Aircraft Materials" is one of the special features scheduled for the thirty-third annual meeting of the American Society for Testing Materials, to be held at Chalfonte-Haddon Hall, Atlantic City, N. J., June 23-27. The papers on this subject have been limited in size to afford concise presentation and to permit consideration of more topics.

World Iron Ore Supply Apparently Is Without Limit

Latest Estimates Place Actual and Potential Reserves at More Than 175 Billion Tons—Large Deposits Discovered in Recent Years

By Charles Hart

President, Delaware River Steel Co., Chester, Pa.

HOW many tons of iron ore are there in the world and how long will the ore last? Ask geologists this question and they will reply: "What do you mean by iron ore?" They want to know if "iron ore" includes iron-bearing formation which at some distant future day may be used for making iron. If so, they will frankly admit that an estimate is impossible. If not, where in the scale of iron percentage will the line be drawn. A low-grade ore today may be desirable tomorrow, with improved methods of beneficiation. Because of that fact there is a double standard of estimating—actual, or usable today; potential, possibly of use in the future.

In an effort to arrive at an intelligent understanding of the world's resources, Charles Hart, president, Delaware River Steel Co., Chester, Pa., has studied the researches of the foremost geologists. He has added the discoveries since their reports were made, and deducted the amount of the ore consumed, to say what the tonnage is today. On this basis he credits North America with 114,000,000,000 tons, actual and potential; South America 8,349,000,000 tons; Europe 29,112,641,119 tons; Asia 22,000,000,000 tons; Australia and New Zealand 991,252,000 tons and Africa 150,000,000 tons. The total is 174,602,893,119 tons.

His conclusion is that the year 2225, one geologist's estimate, "is much too early for the exhaustion of the world's supply."

The accompanying article is an abstract of one part of his elaborate paper on the subject. As he is an eastern steelmaker he has given studious attention to foreign ores, and it is this part of his paper which forms the basis of this abstract.

STEEL manufacturers of Europe are America's competitors, especially those in England, Germany and France. The iron ores available to those countries are of first importance to us. We, in a small measure, import European ores and share in a competitive way in the other ores upon which they depend for a supply.

The United Kingdom is credited with 2,306,947,000 tons of actual ore as of 1922, with possible additional reserves of 9,447,372,000 tons. As the approximate consumption of its ore since then has been 55,000,000 tons a present total of 11,699,319,000 tons is indicated. In view of the fact that England now imports about one-third of its ore requirements it may be assumed much of this reserve is unavailable under present competitive conditions, and such is the case, for the ores are low in iron content and need roasting before use in the furnace.

The hematite ores constitute 130,300,000 tons of England's reserve, and with importations from Spain and North Africa form the ore mixture used in making England's hematite steel.

Undoubtedly Germany's situation is most significant to us in that we may expect from it the severest competition in iron and steel products in our own home market as well as abroad. The German methods of business to which they bring diligence and knowledge place them in this position. Their proximity to one of the great world deposits and partial ownership in it and the abundance of fuel makes the nation a power in iron and steel.

Immense Holdings Indicated

The records indicate immense holdings of ore, other than the Minette, and they are capable of admixture with the richer ores imported from Sweden and Spain. It is not likely that any of the German ores, as such, will find their place in American mixtures. Max Roesler in his "Iron Ore Resources of Europe" places the total German reserves at 1,374,400,000 tons, and of this total 250,000,000 may be considered as actual.

The Minette situation has been greatly disturbed by reparations since the war. Prewar figures indicate that France owned 3,000,000,000 tons and Germany 2,330,000,000 tons of the Minette reserve with the addition of Luxemburg and its close German alliance.

Germany and France were practically on a parity, but due to reparations practically all of this Minette ore now is creditable to France. Although France has this large tonnage under national control much of actual ownership is vested in German corporations. The ores of Germany remaining are notable for their low iron content. Reference to analyses explains their need of richer imported ores and the use of Minette, available by purchase from Luxemburg and France. The reserve as of 1929 is 1,300,238.526 tons.

Prewar conditions developed close commercial relations between Germany and Luxemburg which are reflected in today's situation, in that large tonnages of Luxemburg's Minette ore are shipped to Germany, although changed political conditions have brought about closer relations

with Belgium because of the latter's coal supply.

The Minette ores are not different from those of France, as in 1921 Roesler used a figure of 270,000,000 tons as the reserve. Deducting ore consumed leaves as of this year (1929) 210,000,000 tons still available. This ore is being used at the rate of 7,770,000 tons per year and indicates a 30-year supply.

The Minette ores in territory now included in France were estimated by the Imperial Mineral Resources bureau, London, as 5,330,000,000 in 1922. Roesler places a figure of 7,825,000 tons as the actual and potential Minette ore as of 1921, exclusive of Luxemburg. From this figure we should deduct ore consumed to 1929, 113,975,322 tons, which places France's present Minette reserve at 7,711,024,678 tons. This with all other actual and potential ore gives a total for France of 9,704,624,678 tons as of 1921 and deduction for consumption yields a grand total of 9,561,219,054 tons.

The Normandy ores with Brittany hematite comprise about 225,000,000 tons of actual ore. These with 30,000,000 tons of ore in the Pyrenees, Brittany and Anjoy hematite and magnetite add 250,000,000 tons to actual reserves all contributing to France's total as shown.

Swedish Ores Magnetic

The ores of Sweden are almost entirely magnetic, many of central and southern Sweden requiring concentration and agglomeration. However, in Lapland we find the sixth of the great world deposits, in masses of excellent magnetite. We are reliably advised that in one mountain alone 1,700,000,000 tons of this ore is known to exist and the body has not been completely prospected, despite the fact that at the Eleventh International Geologic congress in Stockholm, 1910, all Sweden was credited with actual and potential ore reserves of 1,336,000,000 tons. Roesler credits Sweden with 2,181,700,000 tons.

The British bureau figures of 1922 place this tonnage at 2,595,700,000 tons. Deducting the interim consumption of 49,270,461 tons gives the 1929 grand total reserve of Sweden as 2,545,429,539 tons.

Shipments from Spain are made from Bilbao in the Bay of Biscay and from several ports on the Mediterranean sea. Spain has one thing in common with Sweden, it is a large producer of iron ore but a comparatively small consumer. In the years beginning just prior to the World war and extending back more than 15 years, Spain's average annual production was just above 8,000,000 tons, over half of which went to England. In no single year did shipments to Germany exceed 1,000,000 tons.

The mines of Spain on account of their not lending themselves to modern methods and machinery have been greatly affected by the disorganizing effects of war upon labor.

It is of interest to note that there has been the same deterioration in the iron content of the Rubio ores as is noticeable in the Lake Superior ores, and about equal in percentage. The Mediterranean ores have found a market in England but not as readily as the ores originating at Bilbao. Foreign capital, mostly English, controls many Spanish mines.

Spanish Reserves High

Spain's total ore was placed at 1,327,500,000 tons by Roesler and a reduction of 28,500,000 tons since 1921 would place the reserves of Spain at 1,299,000,000 tons as of today.

The countries named are the principal ore producers of Europe. Their total reserves as of 1929 may be placed at 26,615,206,119 tons, to which may be added 2,497,335,000 tons from all other countries, in giving that continent a reserve of 29,112,641,119 tons.

Aside from the North coast of Africa the ores found on that continent are unimportant. North Africa is credited with 150,000,000 tons, two-thirds of which lies in Algeria. The balance of Africa is practically unmeasured, estimates running vaguely from "considerable," through "many thousand million tons" to "enormous."

British India seems to be the outstanding country in Asia because of recent developments in operations whereby India is now shipping more pig iron to America than any other foreign country, as well as the development of its own steel industry. Recent discoveries of ore near Calcutta add immense reserves to the world's supply. The ore in itself will not, at least for many years, be available to American furnaces. Charles P. Perin, than whom there is no greater authority on Indian iron and steel matters, advises that these discoveries of ore represent holdings in excess of 20,000,000,000 tons. within reasonable distance of India's best coal deposits. The ores of this country are of excellent quality largely laterite, not however to be confused with chromiferous laterites which abound in Cuba.

India's reserves were placed at 750,000,000 tons in 1910. However, it would seem that Perin's 1920 figure is a sufficient reserve for any nation, adding as it does a century of ore consumption based upon the rate now holding in the entire world.

F. R. Tegengren in his "Iron Ores and Iron Industry of China" states that the total reserves of China may be placed at 941,700,000 tons, of which 396,000,000 tons are actual and the balance potential. The entire tonnage has an average iron content of about 40 per cent. Japan shows only 80,000,000 tons in accredited reserves.

It would seem that all Asia contains, according to the latest reports, ores in excess of 22,000,000,000 tons.

Australian islands contain immense ore reserves, but are too far from America to be pertinent at present. One ore, Broken Hill manganiferous, reaches this country as ballast for ships carrying wool. Reserves may be placed at 921,678,000 tons, with 69,574,000 tons in New Zealand, or a total of 991,252,000 tons.

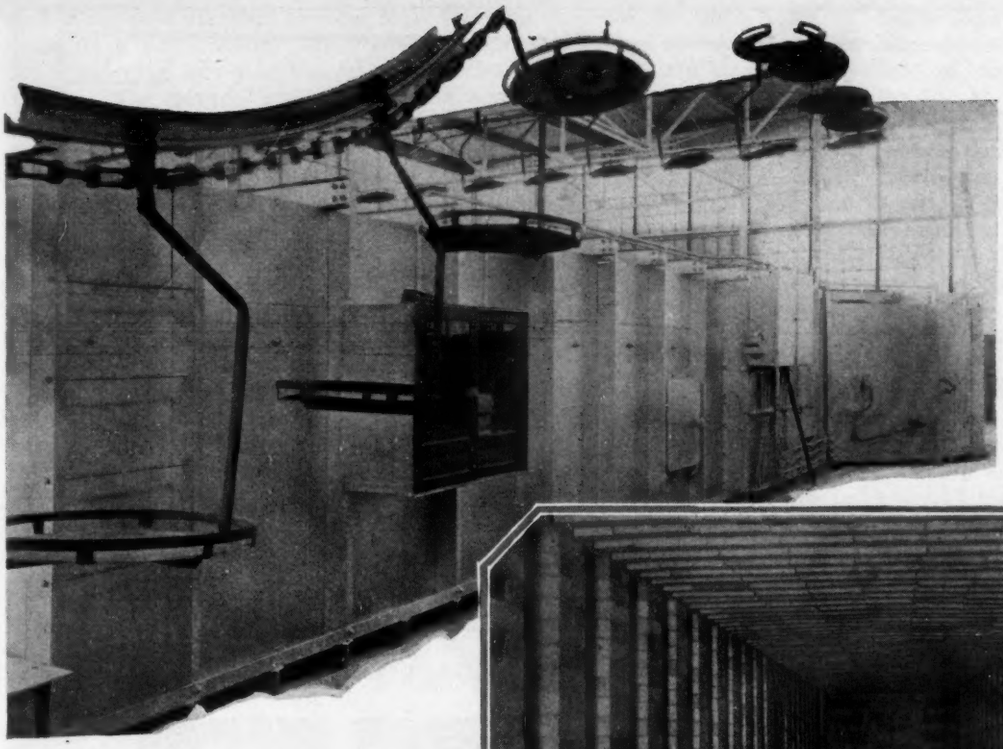
Aggregate figures derived from the various continents give a world's supply of 174,602,893,119 tons. This takes into account Perin's addition of 20,000,000,000 tons of newly discovered ore in India and numerous additional discoveries. As the total does not include any of the reserves estimated as being "enormous" which are of unknown tonnages, it is believed the figure approximating 175,000,000,000 tons of ore is under rather than over the world's supply.

Imports Equal Domestic Production

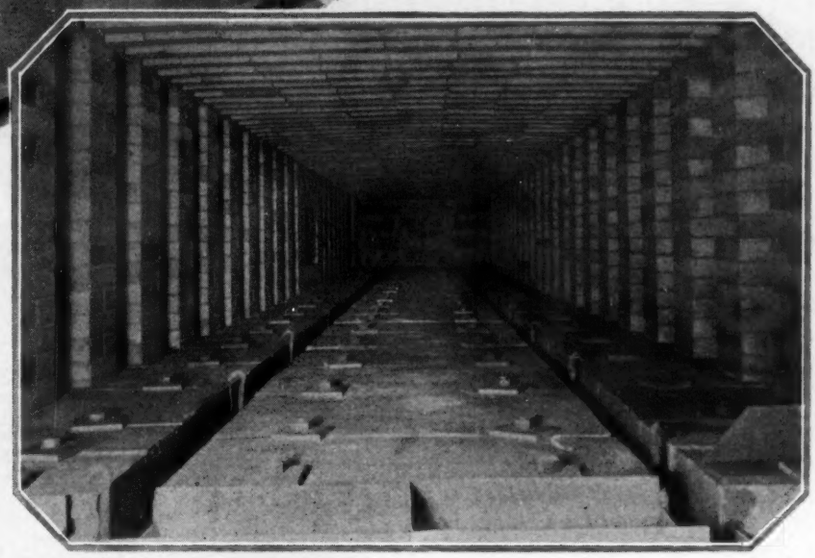
Statistics show total imports into the United States for the 40 years, 1882 to 1928, inclusive, of 54,674,948 tons, which closely approximates the average yearly production of the Lake Superior mines. In no single year during this period have imports exceeded 3,000,000 tons, and the average annual imports over the last five years aggregated 2,768,430 tons per year, of which two-thirds came from American-owned foreign mines.

Our real interest in the matter of the exhaustion of American ore is the substitution of foreign ore in its place. When this condition arises an increase in imports may be expected.

The world's supply of ore seems without limit and even to a greater extent the same condition holds in the United States. It is difficult to predict the life of these reserves based upon any data now available. In 1924 Perin stated that the actual reserves would be exhausted by the year 2025 and that the potential reserves would be gone within 200 years thereafter. In view of later data the writer feels that the year 2225 is much too early for the exhaustion of the world's supply of ore. Eventual exhaustion will depend entirely upon the development of beneficiation and transportation.



Side view of enameling furnace showing temperature control equipment



Interior of continuous enameling furnace looking toward firing zone

Continuous Enameling Furnace Is Heated Electrically

By J. D. Knox

Associate Editor, Iron Trade Review

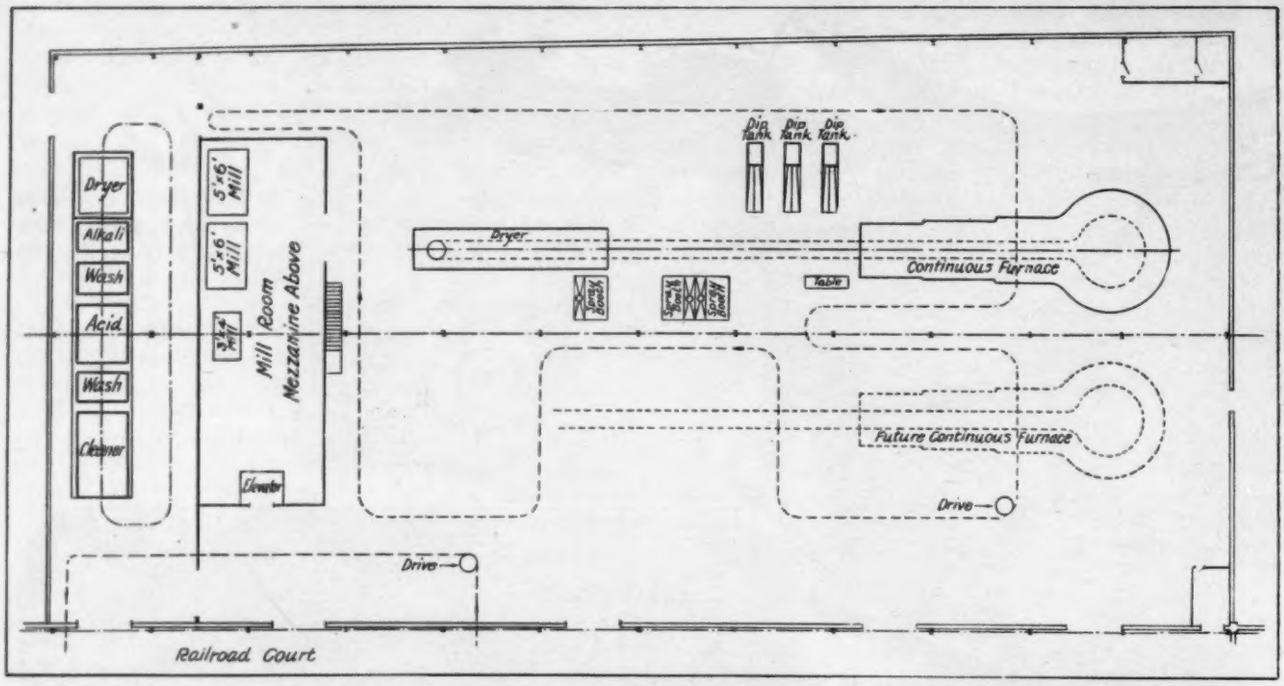
WASHING machine tubs surfaced with porcelain enamel is one of the recent applications of steel sheets. These tubs, as fabricated by the Mullins Mfg. Corp., Salem, O., are drawn to any required depth and diameter by double-acting toggle presses. One department set aside for the production of washing machine tubs in the Mullins plant, houses numerous presses, annealing furnaces and an elaborate chain conveyor system.

Early this year the company completed an enameling plant for surfacing the tubs. The new department, housed in a separate building 104 x 218½ feet, is equipped with modern pickling, enamel grinding mills, spray booths, dip tanks, a continuous enameling furnace and an extensive conveyor system. The pickling department is located in a separate room at one end of the building. Adjacent to the pickling room is the department in which the various colors of enamels are prepared.

Three Grinding Mills Provided

Here are installed three motor-driven grinding machines. Two units each have a capacity for milling 2000 pounds of ground coat, frit and production colors, the third unit of 400 pounds capacity being used for milling any special colors. The mills are mounted on elevated concrete foundations and are charged through doors in the mezzanine floor. Upon completion of the milling operation the colors are discharged into storage cans mounted on casters to facilitate spotting beneath each machine.

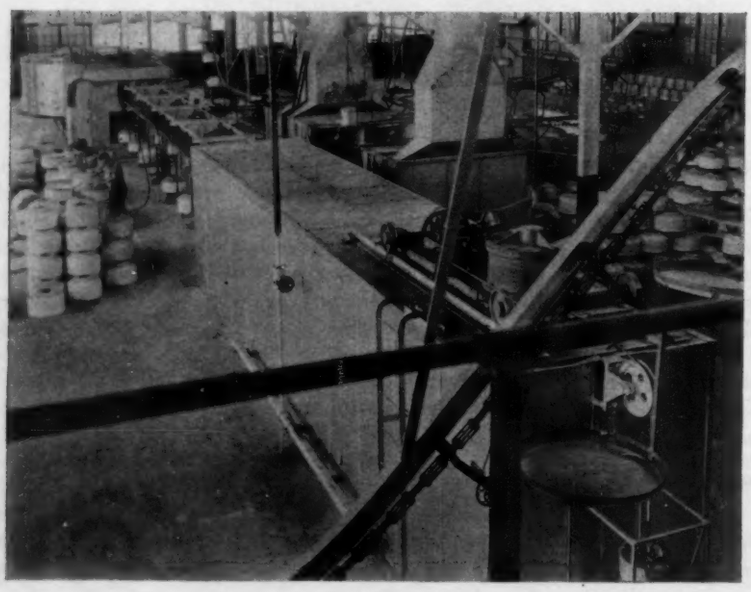
The pressed tubs are delivered to the pickling department by an overhead conveyor and are transferred from the carriers to monel metal pickling crates. An electrically-driven



Plan view (above) of enameling shop of Mullins Mfg. Corp., devoted to the coating of washing machine tubs

Conveyor and burning tools for moving ware in and out of enameling furnace. The drying oven is shown at right

General view of enameling shop as seen from mezzanine floor. Drying oven is shown in foreground and continuous enameling furnace in left background



hoist suspended from a monorail over the tanks transfers the loaded crates to the cleaning tank and thence to the wash, acid, wash, alkali and drying tanks. The accompanying layout shows the arrangement for the continuous movement of stock in and out of the various tanks. Each crate when unloaded is returned on a roller conveyor which runs lengthwise of the pickling department.

Tubs Are Dipped

Following the drying operation the tubs are removed from the crates, placed on separate baskets suspended from a conveyor and are delivered to the ground coat station in the enameling shop. The ground enamel is applied by dipping, three tanks being provided for this purpose. Each tub

then is set on a standard burning tool made of a heat-resisting alloy steel and is conveyed into a continuous-type furnace. The furnace, which was designed by the Ferro Enamel Supply Co., Cleveland, is approximately 56½ feet long and is divided into a preheating and cooling zone and a firing zone.

During the first 40 feet of travel the ware passes through the three preheating zones, circles the rear of the furnace, which is the firing zone and returns to the entrance. While returning, the ware radiates part of its heat, this being absorbed by the ware on its way to the firing zone. Thus, the first zone serves a double purpose, that of preheating, and cooling the ware in transit. The firing zone is electrically heated by elements mounted in three rows on the circular wall of the chamber. The furnace is rated at 330 kilowatts and a temperature range of 1560 to 1580 degrees Fahr. is maintained by pyrometric control. The temperature at the entrance is 600 degrees Fahr. Approximately 120 tubs in ground coat weighing 22 pounds each are burned an hour, the chain feed of the conveyor for this rate of production being about 6 2/3 feet a minute.

Enamel Is Sprayed

As the tubs in the burned ground coat leave the furnace they are transferred to the shop conveyor baskets and kept in motion around the shop. When the vessels are cool enough to handle they are removed from the conveyor near the spray booths centrally located in the enameling shop. Three booths are provided. Here a coat of enamel is applied by spraying.

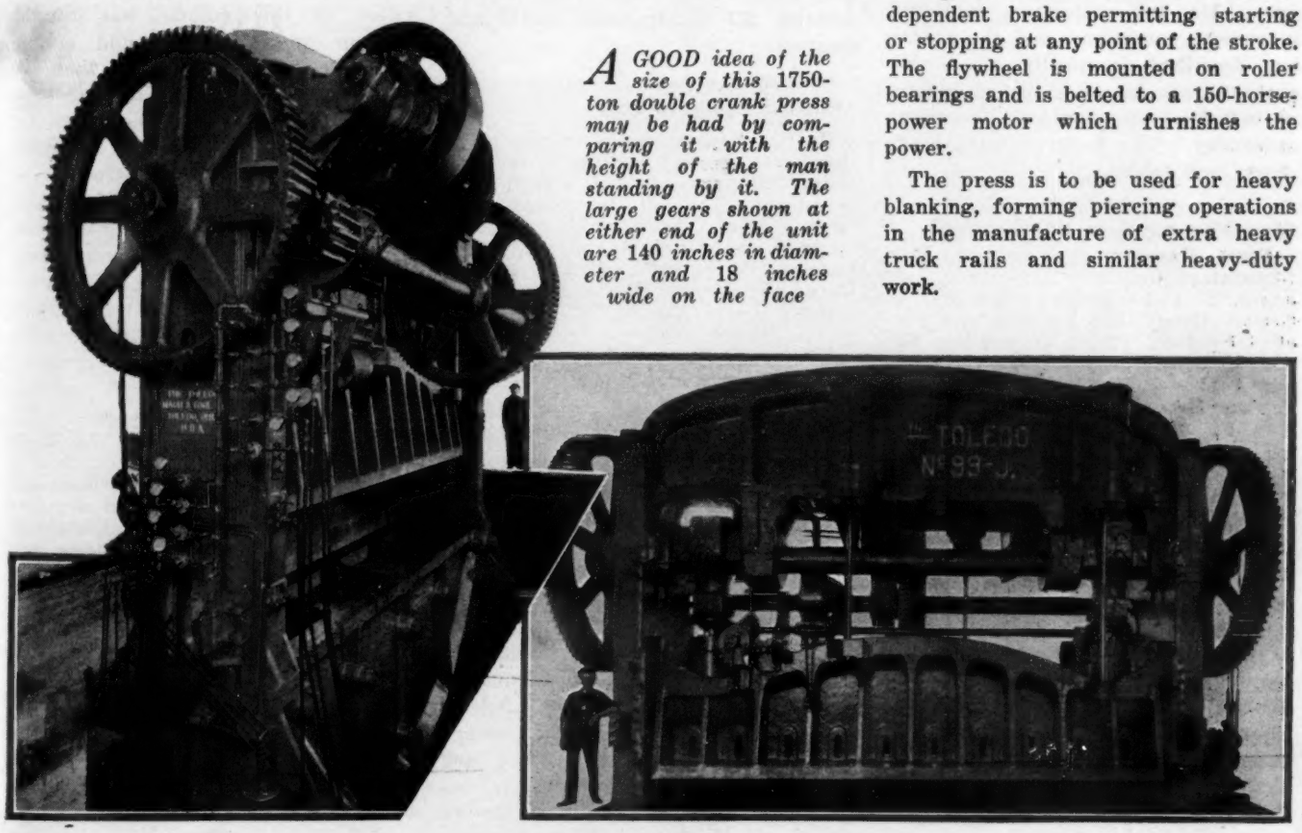
The tubs next are placed on the various burning tools coming from the continuous furnace and are conveyed forward into a drying oven. The dryer, 36 x 6 feet, is gas fired. Near the rear end of the dryer the conveyor makes a 180-degree bend and returns the ware to the front or charging end, and thence 46 feet ahead where it enters the continuous furnace. The ware passes through the various zones and returns with its coating baked thoroughly. The tubs then are stippled, again conveyed in and out through the dryer and continuous furnace, and, after cooling, are ready for shipment.

Double Crank Press Believed To Be World's Largest

WHAT is believed to be the largest crank press ever built recently has been completed by the Toledo Machine & Tool Co., Toledo, O. The accompanying illustrations give some idea as to the immensity of the unit, as do the following figures: Weight of crown, about 130,000 pounds; weight of slide, about 130,000 pounds; weight of bed complete, about 300,000 pounds; total weight of the press, about 800,000 pounds. The two steel gears on the crankshaft are 140 inches in diameter with an 18-inch face. Dimensions of the bed are 288 inches left to right and 68 inches front to back. Pressure exerted at the bottom of the stroke is 3,500,000 pounds with a small amount of deflection. Total height of the press is 36 feet, necessitating its construction in a pit, bringing the operating level below the floor line, which will not be the case when the press is installed for operation.

Notwithstanding the great weight of the moving parts, the slide has been counterbalanced carefully by four air cylinders, two of which are in front and two in back. These counterbalances insure smooth running of the slide which operates at seven strokes per minute. Control is through a multiple-disk friction clutch with independent brake permitting starting or stopping at any point of the stroke. The flywheel is mounted on roller bearings and is belted to a 150-horsepower motor which furnishes the power.

The press is to be used for heavy blanking, forming piercing operations in the manufacture of extra heavy truck rails and similar heavy-duty work.



A GOOD idea of the size of this 1750-ton double crank press may be had by comparing it with the height of the man standing by it. The large gears shown at either end of the unit are 140 inches in diameter and 18 inches wide on the face

New Books Worth Reading

SCIENCE · ECONOMICS · BUSINESS

Paying Workers on Output Basis

Wage Incentive Methods, by Charles Walter Lytle; cloth, 457 pages, 5¾ x 8¾ inches; published by Ronald Press Co., New York, and supplied by IRON TRADE REVIEW for $7.50, plus 15 cents for postage, and in Europe by the Penton Publishing Co. Ltd., Caxton House, Westminster, London, for 37s 6d.

A survey in December by the National Metal Trades association indicated that 54.3 per cent of the shops identified with the association utilize incentive plans of wage payment, and that 45.7 per cent adhere to the time basis of payment exclusively. The rapid increase in the number of metalworking shops using incentive systems should make the book of special interest in this field. The author claims that an effective incentive can be arranged for any work which can be measured as to quantity, quality and material economy. No one system is applicable to various conditions, and the author has described practically all of important ones in use. He is director of industrial co-operation, New York university. The book contains many charts and tables.

* * *

Blast Furnace Seen Internationally

Blast Furnace Practice, by Fred Clements; Volume III; cloth, 400 pages, 8 x 10 inches; published by Ernest Benn Ltd., London, and supplied by IRON TRADE REVIEW for $16, plus 15 cents for postage, and in Europe by the Penton Publishing Co. Ltd., Caxton House, Westminster, London, S.W. 1., for £3 3s, net.

Operation and the utilization of subsidiary products of the blast furnace are discussed comprehensively in this volume which will interest blast furnace engineers and designers, operators and those planning to engage in this sphere of work. Full explanation of the method used for computing a complete burden is given in chapter I, accompanied by 12 charts. Because burden calculations based on chemical proportions cannot be deemed absolute, the author presents the important factors which affect the continuity of normal operation and discusses the importance of furnace temperature and physical character of materials charged.

Methods of blowing in, banking and blowing out stacks, as followed by the industry in England, France, Germany and the United States are compared. A diagram, presented in Chapter IV, shows graphically the range of operating problems which can arise to affect the working of a furnace. Many specific instances of major problems and the way in which they were solved are discussed in detail. Separate chapters are devoted to the discussion of safety and hygiene, economics of labor, operating records and costs, gas cleaning, utilization of blast furnace gas, treatment of flue dust and slag, the manufacture of ferromanganese and other ferroalloys, and the production of charcoal and electric pig iron. The volume contains 221 illustrations, charts and diagrams.

* * *

Antitrust Policy to Date

Public Regulation of Competitive Practices, second edition, revised; cloth, 320 pages, 6 x 9 inches; published by National Industrial Conference board, New York, and supplied by IRON TRADE REVIEW, Cleveland, for $3, plus 15 cents for postage, and in Europe by Penton Publishing Co. Ltd, Caxton House, London, for 15s, net.

First edition of this work has become standard and authoritative. The second edition has been revised to bring it up to the present state of the law on regulation of price and trade relation policies, less-than-cost selling, resale price maintenance, misbranding, trademark stimulation and similar practices.

A new chapter has been added on the trade practice conference, which is a new development of significance to business men. New and significant cases brought before the federal trade commission and those appealed to the courts have been added and importance of the decisions is explained. Much new light is thrown on interlocking directorates and stock acquisition.

The appendix gives a complete record of federal trade commission proceedings.

* * *

Steelmaking, the Art

Practical Steelmaking, by Walter Lister; cloth, 413 pages, 5½ x 8¾ inches; published by Richard Rimbach, Pittsburgh, and supplied by IRON TRADE REVIEW for $1.25, plus 15 cents for postage, and in Europe by Penton Publishing Co. Ltd., Caxton House, London, for £1 16s 6d.

Among the many books written on the making of steel most are metallurgical treatises which do not give to the man working the furnace the definite and practical information he needs. The student at the outset of his career in steelmaking finds relatively little printed information as to procedure.

In an effort to supply this lack the writer of this volume has sought to sum up in concise and simple form the results of more than 20 years experience in steelmaking.

He has sought to confine his material almost entirely to the essentials that come under direct control of the steelmaker. The young student also has been kept in mind and much material is supplied that had not hitherto appeared in print. By this means it is hoped to aid the student to gaining information readily that usually requires years of actual experience.

* * *

Effects of Railroad Buying

Railroad Purchasing and the Business Cycle, cloth, 309 pages, 6 x 9 inches; published by the Brookings Institution, Washington, and supplied by IRON TRADE REVIEW, Cleveland, for $3, plus 15 cents for postage, and in Europe by Penton Publishing Co. Ltd., Caxton House, London, for 15s, net.

Investigation of the belief that alternating periods of expansion and depression in the railroad equipment industry have exercised an important influence on the general business cycle in the United States has furnished the data making up this vol-

ume. Test of the correctness of this theory rests on analysis for the period 1870-1926 of the relationship in point of time between the appearance of improvement or recession in general business conditions and the volume of railroad purchasing.

It is a contribution to knowledge of the complex phenomena of business cycles. The investigation shows clearly that throughout this period there was a distinct tendency for changes in volume of railroad buying to anticipate changes in volume of general activity. It appears also that this tendency has been decreasing in recent years. Much detail is included bearing on variations in purchasing of various types of railway equipment and the correlation between railway purchasing and earnings of the roads. The book is of interest to students of railway management and finance, as well as the business cycle.

* * *

How Heat Travels

Der Industrielle Warmeubergang, (Industrial Heat Transfer); by Dr. A. Schack; 408 pages, 5½ x 8 inches, 41 illustrations; published by Stahleisen, Dusseldorf, Germany, and supplied by IRON TRADE REVIEW, Cleveland, for $4.65, plus 15 cents for postage; in Europe by Penton Publishing Co., Ltd., Caxton House, London, for £1, net.

Here is a book that contains in a lucid and well-arranged manner the various heat transfer formulas that heretofore were scattered through the literature of many countries. The book also contains the derivation of the various formulas and some heretofore unpublished material. Furthermore, it contains critical discussions with regard to the range of applicability of the different formulas.

Dr. Schack is well known for the classical work done by him in radiation of gases and flames.

The book treats of conduction, convection, and radiation. It considers constant and variable heat flow, simple and composite walls, parallel flow, cross-flow, and counterflow, heat transfer from condensing vapors; recuperators and regenerators, luminous and nonluminous flames, heat transfer in boilers, radiation through openings. Last, not least, Dr. Schack's book contains almost 20 pages of well selected physical constants such as thermal conductivity, density, specify heat, viscosity, and radiation coefficients.

All formulas are derived from first principles, and the reliability of experimental coefficients is critically discussed at the hand of all available data. The author has done fairly well in utilizing international data, although German experimenters, quite naturally, predominate.

An early translation of Dr. Schack's work is very desirable, because there is no book in the English language now available that offers engineers just what they need in heat transfer. The book should find a ready market among mechanical engineers (including automotive and refrigerating engineers), chemical engineers, and metallurgists. Heating and ventilating engineers will, likewise, find many valuable hints in Dr. Schack's book, particularly in the study of the relations between heat transfer and pressure drop in pipes. —By Prof. W. Trinks, Pittsburgh.

* * *

A Handbook of Mechanics

Mechanical World Year Book; cloth, 180 pages, 4 x 6 inches; published by Emmot & Co. Ltd., Manchester, Eng., and supplied by IRON TRADE REVIEW, Cleveland, for 50 cents, plus 15 cents for postage, in Europe by Penton Publishing Co. Ltd., Caxton House, London, for 1s 6d, net.

An annual publication for engineers, it has been brought to date by several improvements, and new sections have been added. Sections on steam engines, steam turbines, condensers and rope drive have been revised and rewritten.

All well established features have been retained to aid in eliminating many of the lengthy calculations frequently involved in matters connected with the design of power plants and to present in concise form information and data often required in workshop practice.

American Engineers Go To Russian Project

SEVERAL executives and engineers of the Austin Co., Cleveland, constituting the main contingent of the field staff shortly will arrive in Nizhni Novogorod, Russia, where the company will build a $50,000,000 automobile plant and model industrial city for the Soviet government. The plant at Nizhni is designed for an annual production of 120,000 Ford automobiles upon completion and 500,000 a year ultimately. The model city will house 12,000 employes and their families in the most modern American style. Members of the Russian party are shown above: Top row, left to right, T. B. Jorgensen, project engineer; H. F. Miter, vice president in charge of foreign operations; W. J. Austin, president; G. A. Bryant Jr., executive vice president; F. J. Moxness; D. H. Kempler; Karel Van Havermaet; R. C. Farrington; P. K. Davis; and E. T. Smith. Bottom row left to right; A. J. Marsh; R. C. Vore; H. C. Patterson; Allan S. Austin; C. F. Appleton, A. F. Surre; and Walter Baggaley.

All members of this first party except W. J. Austin and Mr. Baggaley are now enroute. Mr. Baggaley will leave some time this month and Mr. Austin will spend several months in Europe this summer.

Mechanical Engineers Observe Founding of Society

President Hoover Awarded Medal at Semicentennial Celebration—Fifteen Foreign Countries Represented by Prominent Engineers

FIFTY years of progress in mechanical engineering are in process of celebration by representatives of the American Society of Mechanical Engineers, commemorating the founding of the society in 1880. Exercises were started Saturday, April 5, at the Engineering Societies building, New York, where delegates, members and guests assembled, registered and witnessed the unveiling of a tablet in the lobby of the building, marking the anniversary celebration, and carrying the inscription, "What is not yet, may be," embodying the hopes of the engineer today.

Fiftieth anniversary medal awarded to distinguished representatives from sixteen leading nations of the world

After a short commemorative program re-creating the preliminary meeting of the society on Feb. 16, 1880, activities were transferred to Hoboken, N. J., where at Stevens institute, a colorful pageant was presented, allegorically depicting the power which has come to man through the constant development of engineering processes.

A welcoming dinner at Roosevelt hotel, sponsored by the metropolitan section of the society, climaxed the first day's celebration. Charles M. Schwab, renowned figure of the iron and steel industry and past president of the society, as toastmaster introduced Paul Doty, vice president of the society, and others who gave brief addresses of welcome and felicitation.

Monday morning, April 7, saw the scene again shifted, to Washington, where a welcoming assembly convened at the National Council chamber of the Chamber of Commerce of the United States. Ralph E. Flanders, vice president of the society, presided while greetings and short addresses were heard from 21 foreign countries, the American Society of Civil Engineers, the American Institute of Mining and Metallurgical Engineers, the American Institute of Electrical Engineers, engineering colleges of the United States, business organizations and others. Monday afternoon scientific monographs were presented in summarizing addresses from eight foreign countries, Austria, Belgium, Canada, France, Germany, Great Britain, Italy and Japan. Due to a late boat the representative from Czechoslovakia who was scheduled to speak on this program was detained and the paper from this country was deferred until Tuesday when summarizing addresses were presented on monographs from Mexico, Netherlands, Scandinavia, Colombia, Uruguay, Switzerland and the United States.

Prepared for Occasion

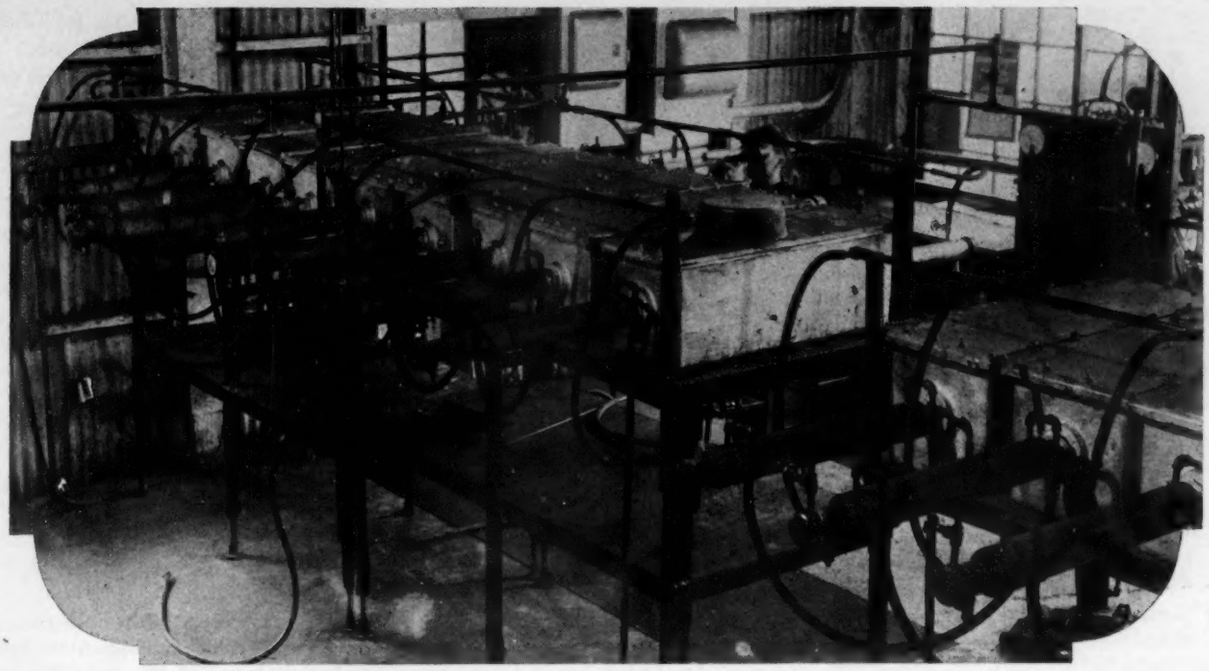
Monographs were prepared specially for this fiftieth anniversary celebration and covered the humanistic aspects of engineering in the various countries. They were prepared by eminent engineering authorities of these countries and were presented in summary by specially appointed representatives. Scheduled presenters of monographs from Austria and Belgium were absent but their remarks were read by deputies.

Tuesday morning, following the presentation of the final monograph, a report prepared by the professional divisions of the society and their representatives was heard, the title being, "A Half Century of Progress in Mechanical Engineering in the United States." A founders' luncheon was held at noon in the ballroom of the Mayflower hotel. John R. Freeman, past president of the society presided and presented special medals to living founders of the society of whom there were six. The response for the founders was made by Ambrose Swasey, Cleveland.

A convocation for the conferring of honors was arranged for Tuesday afternoon, the presiding officer being Conrad N. Lauer, vice president of the society, who presented medals on behalf of the society to distinguished foreign guests. The chief diplomatic officer of each country introduced the author of the monograph from that country who was presented with the fiftieth anniversary medal, designed by Julio Kilenyi, and reproduced on this page. Following these ceremonies, the Daniel Guggenheim medal for aeronautics was awarded for the first time, to Orville Wright for "notable achievement in the advancement of aeronautics." Presentation was by

(*Concluded on Page* 75)

Reverse side of the medal, typifying 50 years of engineering progress. Design is by Julio Kilenyi



Battery of hydrogen reduction sintering furnaces of the production type

Tungsten Carbide Cutting Tools Are Winning Greater Favor

Correct Angles, Rakes and Clearances, as Well as Grinding Procedure, Worked Out as Manufacture Is Placed on Production Basis

By Owen K. Parmiter

Metallurgical Engineer, Firth-Sterling Steel Co.

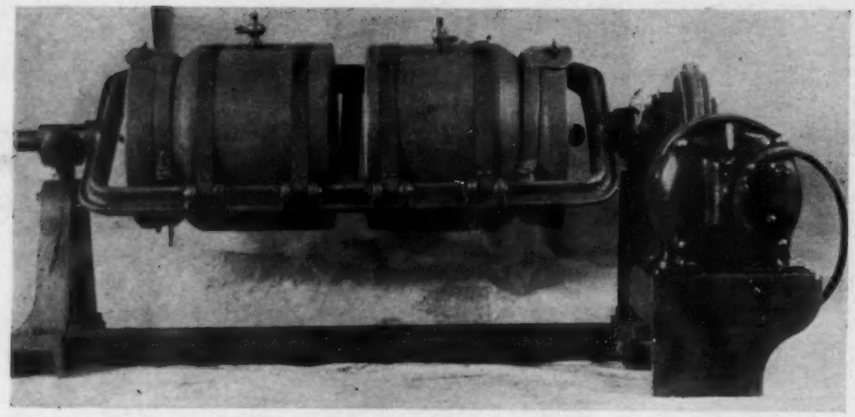
FEW, if any of the new high production cutting materials have attracted the widespread interest that has been given cemented tungsten carbide whose advent as a material for dies and high-speed cutting tools is of a revolutionary nature. This hard, metallic substance is destined to change our ideas as to what constitutes machinable and nonmachinable material. It is being used for cutting substances such as glass and porcelain which heretofore no other metallic tool has been able to cut. The extreme hardness of combined carbon and tungsten has been known for many years, but only within recent years have efforts been made to utilize its unusual properties commercially.

The intense hardness of tungsten carbide is comparable only to that of the diamond. Alone, it lacks sufficient toughness to be used for most industrial applications. In an effort to increase its toughness and strength, it is now used in the form of a fine powder held together by varying amounts of cobalt or other metals used as a binder. It is obvious that any toughening by increasing the binder must be accomplished without too great a sacrifice to hardness or structure. Depending upon the properties required, cobalt has been used most successfully in varying amounts from 6 to 13 per cent.

Tungsten combines with carbon to form two important carbides, W_2C and WC. The former, W_2C, has a composition of approximately 97 per cent tungsten and 3 per cent carbon, while the other, WC, contains about double the amount of carbon and only

Subject Is of Interest

THE comparatively recent development of tungsten carbide cutting tools has attracted wide attention both in America and abroad and information concerning manufacture, grinding and applications of the new alloy is sought eagerly. The accompanying article, a part of a paper presented before the Columbus, O., chapter of the American Society for Steel Treating, April 8, constitutes a valuable discussion of this subject. A second part dealing with high production tool and die steels will appear in an early issue. The author, Owen K. Parmiter, is metallurgical engineer, Firth-Sterling Steel Co., McKeesport, Pa.



Small ball mill in which tungsten carbide powder and cobalt powder are intimately mixed before being compacted

94 per cent tungsten. The latter compound, the monocarbide (WC), is the principal constituent of the new cutting material. In the production of this compound, pure and finely powdered metallic tungsten is mixed intimately with the proper amount of lampblack or some other suitable form of carbon. This mixture is exposed under an atmosphere of hydrogen to a high heat for a predetermined period of time. It is necessary that the resulting carbide exist as an extremely fine powder which subsequently is mixed uniformly with the proper amount of cobalt powder of equal fineness. The resulting product must be worked for hours in a ball mill to coat each microscopic particle of carbide with cobalt, and is then ready for compacting. The operation of compacting is accomplished by pressing the finely powdered substance in suitable dies under hydraulic pressure.

Sintered to Hold Shape

It is then sintered partially by heating to a temperature considerably under the melting point of cobalt. This first sintering operation puts the material into a condition in which it can be handled without crumbling and can be shaped by filing, drilling or sawing. The sintered shape is not really machinable in the sense that particles may be cut away in the form of chips, but the partially sintered powder can be removed with ease. After the die or tool tip is shaped, it is ready for the final sintering or cementing process, which is done at a white heat in a specially designed electric furnace and in an atmosphere of hydrogen. As cobalt is the cementing material, a temperature closely approaching the melting point of that metal is used.

Thus, an intensely hard substance, with a high compressive strength and a closely refined and uniform structure, is produced without actually melting or fusing the component parts. The method of producing this remarkable material by sintering, without fusion, opens up a new field in metallurgy, in that melting, forging and heat treatment are not necessary. Cemented tungsten carbide has no temper to be drawn; therefore, temperatures up to a good red heat have no effect upon its cutting properties. Its "red-hardness" surpasses that of any other metallic substance used in the tool industry.

Some difference of opinion has been expressed as to whether the combination of tungsten carbide with a metallic binder, such as cobalt, is really an alloy or whether it exists as an aggregate of extremely fine grains of a metallic matrix. Regardless of this technical point, it possesses a smooth, closely refined structure which resembles carefully hardened high-speed steel. Cemented tungsten carbide is highly resistant to the softening effect of high temperatures and it possesses an almost unbelievable resistance to abrasion. Some of the most interesting properties of this remarkable material are shown in an accompanying table below.

Tungsten carbide will scratch the sapphire, and the sapphire, with a hardness of 9.50 on the Moh's scale, ranks next to the diamond, whose hardness on the same comparative scale is 10.00. As yet, no testing machines have been developed to measure accurately the extreme hardness of this metallic substance. By modifying the usual operating conditions of various testing machines and then extrapolating and comparing results, it has been found that prepared tungsten carbide shows a hardness value in excess of 1500 brinell, which is considerably more than double that of the hardest steel. The average surface hardness of nitrided steel is estimated at about 1000 brinell.

Applied by Tipping Tools

Being a costly material, cemented tungsten carbide is applied to cutting tools by inserting a small tip on a shank or holder of much cheaper material, usually some form of tool steel. The process of tipping is not without its difficulties. Serious complications have arisen in the past which have been eliminated partially and in some cases, entirely by improved methods of inserting and holding the tip.

The first method employed for tipping was that of brazing the carbide material to the steel shank with copper, under an atmosphere of hydrogen. Such practice apparently is well adapted to smaller tools and in most cases where it has been used on this type of tools it has given satisfactory service. For certain larger tools welding seems to give better results and usually is preferred. Welding, however, is attended by the hazard of cracking the carbide tip itself but with proper manipulation this usually can be avoided. While brazed and

Cemented Tungsten Carbide (WC + Co)

Typical Composition

	Per cent
Carbon	5.50
Tungsten	86.50
Cobalt	8.00

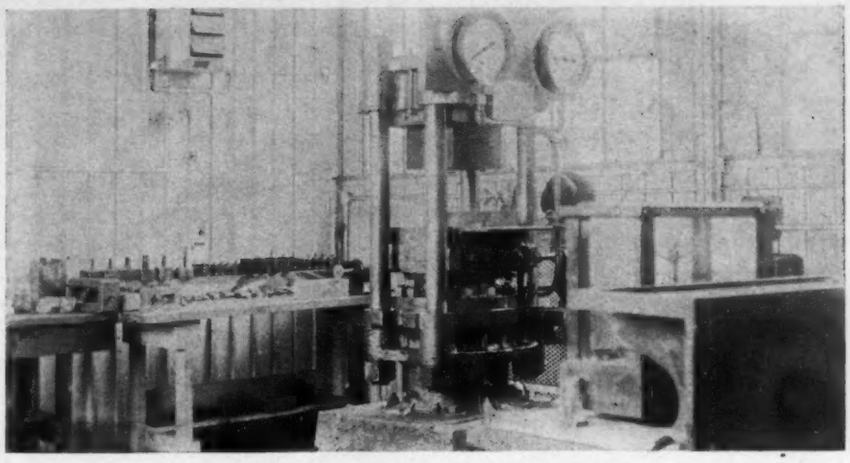
Specific gravity		*Hardness (Moh's scale)*	
High speed steel	8.50	Diamond	10.00
Cemented tungsten carbide	14.50	Tungsten carbide	9.80
Metallic tungsten	18.70	Sapphire	9.50

Melting point of tungsten carbide	5000 degrees Fahr. (Approx.)
Modulus of rupture, transverse	275,000 pounds per square inch
Modulus of rupture, hardened high speed steel	425,000 pounds per square inch
Compressive strength (extrapolated)	540,000 pounds per square inch
Rockwell hardness	75 C (Approx.)
Brinell hardness	Over 1500

welded tips have given good results for ordinary work, results obtained from their use in some cases have not been satisfactory.

The most recent development in the way of applying the carbide to cutting tools is that of the "mechanically held" tip. This method utilizes the combined effect of pressure and wedge action, at the same time protecting the tip against mechanical stresses and also strains due to temperature changes which occur from frictional heat while the tool is in operation. The "mechanically held" principle will extend the use of tungsten carbide tools to that field of machining heretofore considered too severe for brazed or welded tools but well within the cutting capacity of tungsten carbide itself.

Another problem in connection with the preparation of a tungsten carbide tool is that of grinding. The ordinary grinding wheel is not suitable for this material, as tungsten carbide will dress a wheel almost as readily as will a diamond. A wheel of special grain and hardness is necessary. The base material of such wheels, in most cases, is silicon carbide. The manufacturers of silicon carbide wheels in this counrty have done excellent work in developing abrasives which will grind satisfactorily this intensely hard substance. Recommendations of four leading manufacturers are as follows:



Hydraulic press in which tungsten carbide powder and cobalt powder are compacted preparatory to sintering

Abrasive Co., Philadelphia.
Roughing: Grain 60 to 80, grade I or J.
Finishing: Grain 80 to 120, grade H (according to size of tools).
Stoning: Grain 60, grade H.
Lapping: Grain FF.

Carborundum Co., Niagara Falls, N. Y.
Roughing: 60 grit, grades N to R, W-G bond.
Finishing: 120 grit, grades P to T, W-G bond.
Stoning or honing: No. 292, 4 x 1 x ½. Machinists' stone.
Lapping: On cast iron or wood disks at 500-1000 surface feet per minute.
Finishing compound: R40 fine.
Peripheral speed: 4000 to 5000 surface feet per minute.

Norton Co., Worcester, Mass.
Roughing, freehand: Grain 60/1, grade I.
Finishing, freehand: Grain 100/2, grade I.
Roughing, machine: Grain 760/1, grade I.
Finishing, machine: Grain 100/2, grade H or I.
Honing: Grain 280, grades N and O.

Precision Grinding Wheel Co., Philadelphia.
Roughing: Grain 36, grade L or M, vitrified.
Finishing: Grain 80, grade I; and grain 80, grade I, vitrified.

Comparative Value of Cemented Tungsten Carbide as a Cutting Material

OPERATION	*TUNGSTEN CARBIDE*		*GRINDING*	
	Time	Cost	Time	Cost
Grinding 13 per cent manganese steel brickyard rolls	7 hours	$35	17 to 40 hours	$70

OPERATION	*TUNGSTEN CARBIDE*		*HIGH SPEED STEEL*	
	Feet per minute	Pieces per grind	Feet per minute	Pieces per grind
Machining silicon steel rotors	350	10	125	1
Axle steel, 0.45 carbon, 250 brinell	70	Time 1 hour	30	Time 2 to 4 hours
Boring mill, facing cast iron	150	Time Pieces 20 minutes 3	50	Time Pieces 1 hour 1
Turning steel casting	90	Time 18 minutes	36	Time 45 minutes

Tungsten carbide tools may be ground either wet or dry. If wet grinding is employed, the stream should be in large volume. Danger of checks or cracks in the carbide tip is present if the stream is light or intermittent.

Since the first introduction of tungsten carbide cutting tools, much effort has been spent in an endeavor to work out on a practical basis the proper angles, rakes and clearances for the tools. To obtain the best results, it is necessary for the user to understand certain peculiarities of tungsten carbide. Clearance angles should be kept at a minimum, in order that as much support as possible be given to the cutting edge. Thin cutting edges should be avoided wherever possible, and as much support as can be obtained from the steel shank should be given against all stresses that may be expected from the particular operation on which the tool is used. The following recommended practice is outlined for the present time—being the result of practical shop experience in machining a number of different materials:

Material	Front clearance degrees	Side clearance degrees	Top side slope degrees
Cast iron	4	4	3
Soft steel	4	4	15
Medium steel	4	4	12
Hard steel	4	4	10
Nonferrous metals	6	6	10-20
Molded composites (Nonmetallic)	6	6	8-12

Top back slope. For all shaper or planer work, front clearance angle should be 3 degrees and tool should be given a negative top rake of from 3 to 5 degrees.

For cast iron, the angles given in the above table have proved generally satisfactory. For work of small diameters, the front clearance angle may be changed to 3 degrees. It should be understood that the introduction of any alloying agent removes cast iron from this class and thereby may call for a change in given rakes and angles.

The tool rakes and clearances outlined for the machining of steels of various hardness have given satisfaction in most cases. Steels of high alloy content may call for some modification of these angles.

The nonferrous metal group includes such metals as copper, brass bearing metals, aluminum, various grades of bronzes and numerous other alloys. These metals vary greatly in composition and machinability, thus the rakes and angles given for this class apply only in a general way.

The group of molded and composite materials includes such compositions as bakelite, texolite, hard rubber, celeron, rabroid, fiber, glyptal, micalex and graphite products. In

Comparative Production of Drawing Dies

DIE	*SIZE*	*COST*	*PRODUCTION*
Chilled iron	0.105	$0.04 per hole	2 to 4 coils
Diamond	0.105	$250 per die	1500 to 2000 coils
Tungsten carbide	0.105	$16.50 per die	About 1000 coils per size
Chilled iron	0.072	$0.04 per hole	2 to 3 coils
Diamond	0.072	$200 per die	About 500 coils
Tungsten carbide	0.072	$16.50 per die	About 500 coils per size

the past, these products could be machined economically only by the use of commercial diamond tools. Although these composition materials are not extremely hard and their tensile strength is comparatively low, their abrasive properties are such that they quickly dull ordinary cutting tools. Carbide tools have replaced almost entirely the diamond in this class of work.

It may be seen readily that the rakes and angles suggested in the summary present a somewhat radical departure from those used with high-speed steel tools. The fact must be appreciated, however, that cemented tungsten carbide is a nonferrous metallic substance, and not a steel. Past experience in the high-speed tool field has no bearing upon the successful application of carbide tools in the metal-cutting industry of today. The fact also should be borne in mind that the condition of the machine, position, rigidity and overhang of the tool, and type or class of operator, are important factors in successful performance.

Generally speaking, tungsten carbide tools should be as large as or larger than the high-speed steel tools they replace. In most applications, a certain size of high-speed steel tool has been found best suited because it has the requisite strength to withstand the pressure and strain of the cutting. In a tungsten carbide tool a certain amount of the steel is cut away to make room for the tip. This means that the supporting steel is actually of smaller cross section at the working end than in the high-speed steel tool, although the tungsten carbide tool is expected to do heavier duty. For severe work, solid tools are preferable to toolholders with tungsten carbide tipped bits.

On intermittent cutting operations, it is particularly desirable that the tool be as large as possible and that the tip be well supported to prevent yielding and vibration.

Ample Power Is Required

Machine tools should have ample power to take care of the work to be done. The spindle bearings should be snug, the gibs nicely fitted and there should be no play in the feeding mechanism.

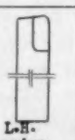
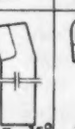
Tools should be set on the center of the work or slightly above it. Any depth of cut may be taken within the capacity of the machine and the strength of the tool shank. The tool should be fed into the work easily and should be supported as close to the cutting edge as possible. The initial speed should be about double that used for a standard high-speed steel tool doing the same work. A coolant may be used if there is a heavy stream. The feed should be thrown out and the tool backed away from the work before stopping the machine for any purpose.

Several practical examples of the relative value of tungsten carbide as a cutting material are listed in an accompanying table. They serve as a general indication of what may be expected of it on steel and cast iron.

The use of cemented tungsten carbide is not limited to cutting tools. It has a much broader field of application. For drawing dies in general, and especially for those used in drawing wire, it has met with tremendous success. On the basis of production, it has approximately the same life as a diamond die, but more re-cutting for larger sizes is possible with the carbide. The over-all improvement in cost on a general performance basis over the diamond is about 6 to 1. In comparison to chilled iron dies, the results are even more outstanding, as in one particular case a single carbide die produced 20 per cent more steel wire than was produced on 264 chilled iron dies. A comparison of costs and production on the three types of dies is presented in an accompanying table.

The creation of cemented tungsten carbide probably has marked the beginning of a new era in metallurgy and shop practice. The new tungsten carbide material as well as new high production steels both are bringing about great economies in production costs. This will result ultimately in making not only cheaper the necessities of life but luxuries as well, thus raising the standard of living and promoting improvements.

Style Numbers and Prices for Standard Cemented Tungsten Carbide Tools (Brazed Type)

Style Numbers	201	205	202	206	203	207	9	5	10	11		
Direction of Cut	←	→	←	→	←	→	→	←	↑	↑		
Typical Shape of Tools (Top View)												
Typical Description of Tools	R.H. Turning Tool	L.H. Turning Tool	R.H. 12° Offset Tool	L.H. 12° Offset Tool	R. H. 30° Offset Tool	L. H. 30° Offset Tool	L.H. 15° Right Offset Tool	R. H. 15° Left Offset Tool	R.H. Boring Tool	L.H. Boring Tool		

STANDARD MECHANICALLY HELD FIRTHITE TOOLS

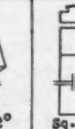
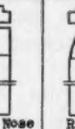
Style Numbers	300	301	302	303	304	305	306	307	308	309	310	311
Direction of Cut	←	→	←	→	←	→	↓	↓	↓	↑	↑	↑
End View of Blank												
Typical Shape of Tools (Top View)												
Typical Description of Tools	R. H. Turning Tool	L. H. Turning Tool	R.H. Turning Tool	L. H. Turning Tool	R.H. 12° Offset Tool	L.H. 12° Offset Tool	Sq. Nose Tool for Light Work	Rd. Nose Tool for Light Work	60° Threading Tool	R. H. Boring Tool	L. H. Boring Tool	Parting Tool

Chart showing style numbers, shape and description of both brazed and mechanically held types of cemented tungsten carbide cutting tools

Electrolytic Extraction Proves Satisfactory

Development of the electrolytic method of extraction of nonmetallic matter from steel by the Pittsburgh experiment station of the bureau of mines, in co-operation with Carnegie Institute of Technology, Pittsburgh, and the metallurgical advisory boards appears satisfactory from most standpoints at the present time. A small amount of theoretical work still is required before complete success can be assured.

Two large MnO-SiO_2 inclusions were measured before and after their electrolytic extraction. Absolutely no change could be found in either size or appearance of these materials after treatment in the method. These particular inclusions were of the composition which would have been entirely dissolved in Dickenson reagents. Likewise, one inclusion was large enough so that part of it could be partially broken from the steel and analyzed. Its analysis indicated the presence of 31.1 per cent SiO_2. After submitting the remainder to the electrolytic method and analyzing the residue it was found that an identical amount of silica was present.

Commemorate Founding of Engineers Group

(*Concluded from Page* 70)

W. F. Durand, president of the Guggenheim medal board.

Dexter S. Kimball, vice president of the society, presented Fred J. Miller, industrial engineer and past president of the society, who was awarded the Gantt medal for 1930 for his early recognition of the soundness of the principles of scientific management.

Contributions in the development of the steam turbine, electric propulsion of ships and other generating apparatus, made by William LeRoy Emmet were signalized by awarding him the American Society of Mechanical Engineers medal for 1929. Conrad N. Lauer presented the medal.

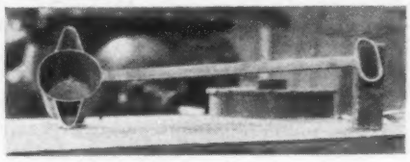
Joseph W. Roe, New York university, New York, was named recipient of the Melville medal for 1929 for his paper on "Principles of Jig and Fixture Practice." Mr. Lauer also presented this medal.

An anniversary dinner was held Tuesday evening at Mayflower hotel. Three addresses were given preceding the feature event of the evening, the institution and presentation of the Hoover gold medal, the gift of four technical societies and awarded for the first time to President Herbert Hoover, in recognition of his humanitarian services. The medal was presented by Dexter S. Kimball.

The festivities were to be concluded Wednesday with several tours of inspection to prominent places of interest in and about Washington, and a reception at the White House planned for 4:30 p.m.

Welder Devises a Useful Ladle for Babbitt

CONFRONTED with the necessity of devising for the machine shop a convenient babbitt ladle for pouring new bearings, the welder of a New York hotel employed the oxyacetylene welding torch to good advantage. The ladle, shown in the accompanying illustration, is the product of his handiwork. It has a long



handle and two lips with a bottom feed so that the molten metal poured is free from slag.

The lips were made up from ⅛-inch steel, heated by the blowpipe flame and forged into shape. The body was made by shaping a cylinder from ⅛-inch steel. Two holes for the bottom pour were cut out by means of the oxyacetylene cutting blowpipe. A bottom plate similarly cut out was welded in position. The lips were then welded on as shown. The handle, heated and forged from ¼-inch steel, also was welded on.

The ladle has been found to be a useful piece of shop equipment, particularly where the great variety and number of machine bearings makes rebabbitting a frequent operation.

Societies Plan Standard Testing Apparatus

In accordance with its policy of approving testing apparatus, the American Society for Testing Materials has accepted a proposal from the Scientific Apparatus Makers of America that the society consider means of co-operation between the two organizations in the development of specifications for apparatus. The apparatus makers' organization is representative of leading manufacturers.

Cleveland Bank Extends Building by Welding

To provide new accommodations for the Cleveland Stock Exchange, the Union Trust Co., Cleveland, has erected a 52-foot square addition on the top of its building. The steel frame was arc welded and was erected by extending the present columns, except in the case of the outside bay where it was found more convenient to set the columns in on the existing beams, and strengthen these beams sufficiently to carry the added weight. This strengthening was done by welding a 24-inch I-beam between the vertical columns under the existing seams. In all other cases the existing beams will serve as the floor for the new story.

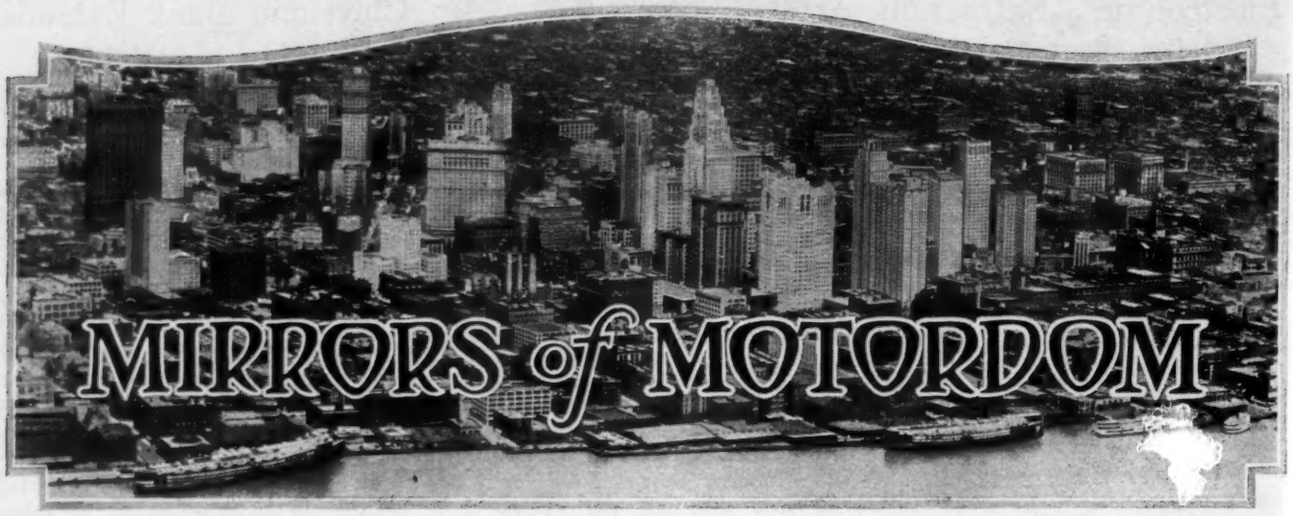
The steel in this addition was erected by the Republic Structural Iron Works, Cleveland, and the welding equipment was furnished by Lincoln Electric Co., Cleveland.

Automotive Group Plans 25-Year Celebration

Growth of the automotive industry from its early days up to the present will be depicted in pageant, speech, written form, exhibits and parades at the quarter century celebration of the Society of Automotive Engineers to be held at French Lick Springs, Ind., May 25-29. The presentation, known as "Twenty-Five Years of Automotive Progress," will constitute the major part of the summer meeting of the society. Leaders in the automotive and allied industries have been invited to help celebrate the twenty-fifth anniversary. The historical material will be obtained from all possible sources. Among the exhibits will be old business papers and newspapers showing early automobile displays and records of achievement.

Constructors Inaugurate Monthly Publication

Monthly news of the American Institute of Steel Construction Inc. will be presented to the members and friends in a new publication of the organization entitled *News Digest* which first appeared in April. It is the intention of the new publication to make all news as brief as possible, but to contain information of broad and general interest in order to advise its readers of the progress being made by the institute, as well as important items of news about the industry.



Ford Widens Lead as Industry Comes Back Slowly

* * * * * * * * *

See 1930 as Merchandising Year; Steel Receipts Up

DETROIT, April 8

MOST manufacturers of automobiles are operating at approximately their March average, a few have expanded their schedules and no important ones have curtailed. Specifications for steel and releases for pig iron for April shipment indicate, at this time, an increase of perhaps 10 per cent over March.

It is in sentiment, however, that the greatest progress is apparent. There is a general conviction that the rigid deflation of automobile production the past sixty days has placed the industry in the best statistical position in several years. Substantially all of the surplus of unsold 1929 cars has been moved, used car accumulations are slightly lower, dealers' stocks of new models are no more than normal, and factory inventories are nil.

Based upon this strong statistical position and the assumption that general business conditions will show marked improvement in the last half year, the best opinion in Detroit today is that automobile production will now rise gradually until about October, the second and third quarters will prove the best of the year, and any midsummer dip will be mild.

* * *

WITH the opening quarter of 1930 past, it is more widely recognized that this will be a merchandising rather than a production year. Mid-year model changes, which will practically complete the transition from six to eight cylinders in most lines selling above $1000, have already received final judgment, and executive attention will be focused upon sales.

In the past few days there has been a moderate downward revision in estimates of 1930 output. When the stock market collapsed last fall, 1930 was immediately set down as a 4,000,000-car year; final figures for 1929 showed 5,358,414 units for the United States and 263,295 for Canada. Then, in January, when the outlook brightened, the United States' figure was marked up to 4,750,000. Now there is more talk of about 4,400,000 to 4,500,000 units which would about equal the 4,358,759 of 1928.

One usually-accurate observer has made the following forecast by quarters including Canada:

	1930	1929*
First quarter	1,003,068	1,546,319
Second quarter	1,300,000	1,867,485
Third quarter	1,300,000	1,460,872
Fourth quarter	1,000,000	747,033
Total	4,603,068	5,621,709

*Department of commerce statistics.

This places 58 per cent of the 1930 total in the second and third quarters, compared with an actual 62 per cent produced in the first two quarters of 1929.

* * *

NO SMALL satisfaction is derived from a comparison of new car registrations with actual production. In the first quarter, automobile output declined 35 per cent from the corresponding period of 1929; pig iron production, incidentally, shrank only 14 per cent.

New car registrations in January, however, were only 15 per cent below last January. In February, the differential under last February was only 8 per cent. The showing of March is expected to parallel that of February.

This indicates that the industry has been selling cars faster than it has been producing them. Assuming that 1930 output equals 1928, the first quarter piled up a deficiency of nearly 100,000 cars.

The national automobile chamber of commerce estimates March production at 400,000 units for the United States and Canada. The best opinion in Detroit places March output at about 350,000 units (plus 15,000 to 18,000 for Canada) compared with 323,962 for February and 585,455 last March.

A year ago automobile production was heading toward the year's high—621,910 units, in April. In May began the decline which was not arrested until January.

* * *

FORD continues to pull away from the field, especially Chevrolet. One day last week 8275 motors were assembled—almost a record for Model A. For April the schedule is 198,000 units, with the same number tentatively set down for May. This indicates a sharp jump in Ford production, which is substantiated by heavier releases to parts makers and the placing of additional steel requirements.

The first million of Model A was completed Feb. 4, 1929, the second July 24, 1929, and the third March

12, 1930. Despite the farming-out of many important parts, Ford employment is slowly rising, more men being employed today in the pressed steel division, for example, than ever before. Most departments are operating 5 days a week, 2 shifts.

Ford is experimenting with a tubular front axle. Slight changes may be made in the front fenders, due entirely to die and drawing difficulties in fabricating the present design.

Ford's difficulties with dealers are mirrored in the resignation of Fred L. Rockelman, general sales manager and 26 years a Ford man. He has been replaced by Claude N. Nelles, who has been steel buyer at Fordson.

* * *

CHEVROLET, whose March output was approximately 90,000 units, has scheduled 100,000 for April. Its operations have been stepped-up slightly, to about 4500 a day, 5 days a week.

Chrysler-Plymouth specifications for steel, while steadily expanding, are not yet to a level indicating the 1000 units daily slated for early April. Plymouth is operating 5 days a week, 250 a day, and Chrysler 6 days a week, 550 a day. March output of this division was 14,161. New eights in the Chrysler line continue to be expected.

DeSoto output is off slightly to 200 a day, 5 days a week. March production was 5642 units. Dodge holds at about 600 a day, 4 to 5 days a week. Its March total was 10,653.

* * *

HUDSON, whose new eight is reported to be giving the medium-price field more to think about than any other new model introduced in the past year, appears to have got away to a good production run. With its flywheel difficulties ironed out by the adoption of a heavier and a harder one, and installations on early models replaced, its schedule is up to 300 a day, 4 days a week. With Essex output at about 500 a day, this line is doing proportionately less than the Hudson. March output of Hudson-Essex was 15,442, almost 4000 under February and January.

Willys-Overland prospects are the best this year. Its foundry division at Pontiac is taking in more pig iron and scrap than in months, and has re-employed practically all of the men let go last fall. Willys-Overland, which turned out 13,000 in March, is operating this week at about 600 units, 5 days, with a higher rate near.

* * *

BUICK has practically completed purchasing materials for its 1930 models. Its output in March was 8760 units, compared with 8842 in February and 15,206 last March. At present it is operating at a rate of 415 daily, 5 days. The April schedule is 9000.

Majority opinion is that the 1931 Buicks will be straight eights. Extensive purchases of drill presses and electric welders have been made recently. It is said that a large share of the patterns, dies, machine tools, etc. used in the production of the Marquette have been shipped to Germany.

Olds has scheduled 10,000 units for April, contrasted with 7676 for March and 6646 for February. At present it is operating 400 a day, 5 days.

Reo, planning to bring out a small model, is at 125 a day, 5 days. Its March output was 2870, against 2568 in February and 4611 last March. A change in the larger Reo models this year would not be surprising.

Hupp's steel specifications are expanding. March shipments of 3212 bettered the 2629 of February by a good margin, and present operations are based upon 175 a day, 5 days. Graham is producing 300 a day, 5½ days; Cadillac-LaSalle, 100 a day, 4 days; Oakland-Pontiac, 600 a day, 5 days; Lincoln, 20 a day, 5 days; and Packard, 125 a day, 5½ days.

* * *

BUSINESS is spottier with body makers than with automobile manufacturers themselves, for one reason because their inventories were relatively heavier.

Fisher Body's offerings of compressed bundles for April from its Detroit, Pontiac and Flint plants totaled 26 cars, compared with 62 for March. It is now seeking die work from other General Motors units.

Hayes Body is closing on 10,000 bodies a month for the remainder of the year for the new Austin "bantam" to be assembled at Butler, Pa. This maker also expects to build the bodies for the new small Reo.

Murray Body is expected to obtain some Reo business.

Timken-Detroit Axle, with a big Ford truck contract, is expanding operations rapidly.

Kelsey Wheel, making most Ford wheels now, is taking steel shipments by water at Memphis from Pittsburgh, and plans a daily output of 10,000 wheels shortly.

* * *

GENERAL MOTORS' annual report for 1929 discloses some of the reasons why Detroit entertains reservations concerning the corporation's immediate outlook.

In the best year ever for the automotive industry, production by all manufacturers increased 25 per cent, while General Motors as a group exceeded 1928 by only 5 per cent. General Motors' proportion of the total output shrank from 41 per cent in 1928 to 35 per cent in 1929.

Pontiac, Oakland, Buick and Cadillac sales showed actual decreases last year. LaSalle barely held its own, while Chevrolet and Olds were the only units to gain. Because of their youth, Marquette and Viking do not afford comparisons.

Sales history of all General Motors' units for the past three years follows:

	1927	1928	1929
Chevrolet	1,001,142	1,189,124	1,333,15+
Pontiac	140,791	214,534	193,622
Olds	58,016	90,202	99,435
Oakland	53,922	45,724	30,826
Marquette	.....	.....	31,475
Buick	268,698	229,788	167,939
Viking	.....	.....	5,902
LaSalle	16,371	21,392	21,498
Cadillac	18,639	20,042	15,416
General Motors total	1,562,748	1,810,806	1,899,267
Net sales	$1,269,519,673	$1,459,762,906	$1,504,404,472

* * *

CHEVROLET'S sales, while recording steady increases, have been predicated upon unusual circumstances. In 1927 and 1928 Ford was either out of production or coming back slowly; in 1929 the introduction of the six provided impetus.

Buick's unchecked decline from 280,009 units in 1926 to 268,698 in 1927 to 229,788 in 1928 to 167,939 in 1929 is one of the saddest experiences in General Motors' history. Even the resort to the Marquette last year failed to push production above 200,000 units. Buick's record the past four years explains the turnover in its executives and the concentration on a new series, rumored to be a straight eight, this year.

Oakland's shift to an eight, following a poor season, appears to forecast Buick's course. Olds, by making a minimum of mechanical changes, has almost doubled its sales the past two years and is now one of General Motors' best divisions. Oakland-Pontiac's carryover of unsold 1929 models was the largest for any of the corporation's units.

* * *

FOR some time there has been speculation whether General Motors would scale down its overhead and make a contribution to an improved competitive situation by dropping some of its lines.

In its five main automobile manufacturing divisions, each operated independently and overlapping in the retail market, General Motors last year produced 1,889,267 cars and trucks.

Ford, with virtually only one plant, turned out 1,709,945 cars and trucks

last year. Its parts makers and branch plants may be considered an offset to the parts units of General Motors. Almost to equal in one plant the output of five General Motors' divisions resulted in obvious economies.

Chrysler, however, is following the lead of General Motors. Its Plymouth, DeSoto, Dodge, Fargo and Chrysler cars and trucks overlap and attempt to blanket the retail market rather than carve out a particular sector.

* * *

FORD sales of by-products, showing a substantial increase in 1929 over 1928, included scrap valued at $5,672,000, compared with $3,619,000 in 1928, the bulk going to the Bethlehem Steel Co. plant at Buffalo.

Other 1929 sales by the Ford organization, in addition to its interplant consumption, included $2,758,000 of coal, $4,313,000 of coke, $325,000 of ammonium sulphate, $2,357,000 of motor benzol, $1,032,000 of portland cement, $169,000 of slag, $373,000 of gas, $579,000 of glass, and $509,000 of charcoal.

Ford sales of all by-products in 1929 totaled $19,344,773, compared with $16,774,672 in 1928.

A prize cup was given recently by the Kokomo, Ind., safety council to the Globe Stove & Range Co. of that city, winner in its class of the safety campaign conducted by the council.

New Testing Machine Has Large Capacity

The new testing machine of 100,000 pounds capacity recently installed at the bureau of standards, Washington, is described in research paper No. 147 of the bureau entitled "A New Dead-Weight Testing Machine of 100,000 Pounds Capacity," by L. B. Tuckerman, principal scientist, Herbert L. Whittemore, principal mechanical engineer, and Serge N. Petrenko, associate engineer. The bulletin outlines the functions of the bureau, the importance of calibrating testing machines and the methods of calibrating and the development of the proving ring for use in dead weight testing. The machine itself is described and illustrated, particular attention being given to the accuracy of the forces which can be applied by it and the precautions for maintaining the accuracy. Copies of the paper can be obtained from the superintendent of documents, Washington, for five cents each.

Ore Unloaders at Presque Isle Nearing Completion

A VIEW of two of the three ore unloaders now under construction for the Hocking Valley railroad at Presque Isle on Maumee bay at the mouth of the Maumee river, near Toledo, O. These machines were designed by the Wellman Engineering Co., Cleveland, and are of the stiff-legged, all-electric type, having a capacity for unloading from vessel to cars 10,000 tons of ore in 4 hours. As announced on Page 97 of the Feb. 20 issue of IRON TRADE REVIEW, the new and modernly equipped coal and ore docks are being built at a cost of $8,000,000 to augment the present facilities for taking care of the Lake Erie trade. The ore facilities will be ready shortly after the opening of navigation, while the coal docks will go into operation by June 1.

Devote Radio Program to Steel Constructors

The Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., will devote its weekly radio salute on April 22 to the steel construction industry. Prosperity will be emphasized particularly because this industry has so greatly aided America's progress. Charles N. Fitts, treasurer, new England Structural Co., Boston, and president of the American Institute of Steel Construction will talk briefly during the program which is scheduled at 10 p. m. eastern standard time over a coast-to-coast network, including stations KDKA, Pittsburgh; WBZ, Springfield, Mass., KYW, Chicago, and WBZA, Boston, Mass.

Cast Iron Testing Topic of Exchange Paper

Testing cast iron will be the subject of the annual exchange paper of the Institute of British Foundrymen to be presented before the thirty-fourth annual convention of the American Foundrymen's association in Cleveland, May 12-17. J. G. Pearce, director and secretary of the British Cast Iron Research association, Birmingham, England, was chosen to prepare and present the paper. Mr. Pearce is one of the world's foremost authorities on cast iron, as his organization has conducted considerable research on the subject. The title of the paper will be "Correlation of Tests of Cast Iron."

Engineers To Aid Museum

Three engineering advisors have been appointed by the American Engineering council to aid in the work of organizing the Industrial museum founded in Chicago by Julius Rosenwald. The appointees are M. E. Cooley, dean emeritus of the colleges of engineering and architecture, University of Michigan, Ann Arbor, Mich.; E. L. Ryerson, Joseph T. Ryerson & Son Inc., Chicago; and Joseph W. Roe, professor of industrial engineering, New York university, New York. These advisors are to help the museum interpret the evolution of science, engineering and industry with regard to society, economics and culture.

FALLS OF CLYDE, a veteran clipper, the sides and framework of which are of wrought iron, is as sound and seaworthy today as when launched at Glasgow 50 years ago to begin a career of varied fortunes in altered guises.

Steel Founders Approve Arbitration Methods

Steel Founders' Society of America Inc., representing the steel castings plants of the country, has recommended to its members that an arbitration clause be incorporated in their purchase and sales contracts as a result of the recent decision of the board of directors of the society to enter into a co-operative arrangement with the American Arbitration association, under which the latter's tribunal facilities would be available to all members of the steel founders' society. The terms of the agreement entered into by the society and the arbitration body provide that the society accept the arbitration rules of the association and approve a certain definite arbitration clause for such voluntary use in contracts as members of the society shall desire. In order to further the effective use of arbitration in the settlement of claims the Steel Founders' society has requested its members to submit to Granville P. Rogers, managing director, all applications for facilities for the settlement of controversies by arbitration in order that he may enlist the co-operation of the American Arbitration association.

Bulletin Discusses Hot Acid Etch for Steel

Insurance against faulty steel is a vital factor in keeping down costs of steel tools of all types and one of the most convenient and effective methods of inspection for internal defects is the so-called "hot acid etch." Carpenter Steel Co., Reading, Pa., has prepared a technical bulletin discussing in detail the equipment, procedure and interpretation of results in this type of etching treatment. Illustrations showing results of typical structures revealed by the hot acid etch for tool steels are included in this 12-page pamphlet prepared by the research department of the Carpenter company. The information is available to anyone requesting technical bulletin B.

Mechanical Group Plans Technical Program

Technical meetings of the semi-annual meeting of the American Society of Mechanical Engineers to be held at Book-Cadillac hotel, Detroit, June 9-12, will be divided into 21 sessions. The professional divisions of the society which have planned sessions include: Applied mechanics, machine shop practice, materials handling, management, aeronautics, wood industries, and printing industries on paper and plup. A symposium on "Air Transportation" is also to be held.

Pamphlet Records State Safety Publications

To permit employers to familiarize themselves with safety requirements in various states, the National Safety council, Chicago, has prepared pamphlet No. 94, "State Safety Requirements in Industry," which outlines the various practices. The pamphlet was prepared by R. H. Ferguson, safety engineer on the staff of the council. Practically every state has in force certain safety requirements for industry which employers in that state must follow. The publications, which may be obtained from the proper authorities, and which set forth the requirements for safety, are listed alphabetically by states and by subjects.

Concrete Bar Statement Proves Confusing

A progress report issued recently by committee A-1 on steel of the American Society for Testing Materials and published on Page 84 of the March 6 issue of IRON TRADE REVIEW contained a recommendation made in connection with billet steel concrete reinforcement bars. Because the report used the word "intermediate" instead of "structural" some confusion was created.

The statement of the committee corrected by substituting the word "structural" for "intermediate" is as follows:

"The committee proposes to recommend for advancement to standard the present tentative revisions of the standard specifications for billet-steel concrete reinforcement bars, which revisions cover the elimination of the present recommendation that the structural grade be used unless otherwise specified. An increase in the allowable tensile range with no decrease in the present minimum ductility and an increase in the phosphorus limit in acid steels are involved."

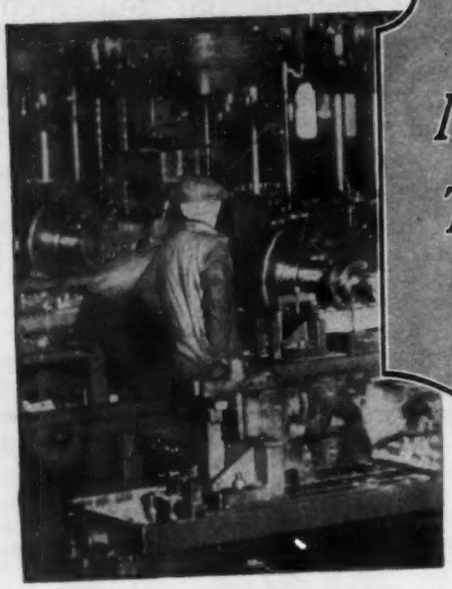
Trade Rules Enforcement Is Studied by Institute

MEMBERS of the Concrete Reinforcing Steel institute, which held its sixth annual meeting at the Bon Air-Vanderbilt hotel, Augusta, Ga., March 31 to April 2, discussed at length the enforcement of trade practice conference rules. The discussion was led by Arthur Fisher of Butler, Lamb, Foster & Page, Chicago, legal counsel for the institute. At the opening session G. B. Walbridge, of the Walbridge-Aldinger Co., Detroit, spoke on "Co-operation in the Building Industry." Stories of the great and near great, which never have been published, were told by Edward McKernon, New York, formerly superintendent, Associated Press, at the annual banquet Tuesday evening.

A paper entitled "Warehouse Operation," by W. M. Bachtell, Truscon Steel Co., Youngstown, O., was presented by G. M. Cook of the Truscon company. The paper aroused so much interest that members voted to have the manuscript reproduced in pamphlet form.

At the business meeting C. Louis Meyer, president, Concrete Engineering Co., Omaha, Nebr., was re-elected president in conformity with the policy of the institute to have its presidents serve a term of two years. O. W. Irwin, vice president, Truscon Steel Co., Youngstown, O., was re-elected vice president; H. J. Baker, president, Hugh J. Baker Co., Indianapolis, was re-elected treasurer; and W. H. Pouch, president, Concrete Steel Co., New York, was re-elected a director of the institute for a period of three years. E. B. Wilkinson, president, Wilson-Weesner-Wilkinson Co., Nashville, Tenn., was elected to represent the South as a director of the institute for a three-year period. M. A. Beeman, Chicago, was re-elected secretary. R. W. Johnson was reappointed as engineer of the institute; J. P. Thompson as district engineer for the eastern territory; and Arthur Burnie as district engineer for the Kansas City territory.

Numerous reports presented by chairmen of the various institute committees included such subjects as credit information, membership, publicity, mill relations, grade of steel, engineering practice, standard practice, market extension, concrete joist construction and a review of the work done by the promotional engineer of the institute. The annual golf tournament was played Wednesday afternoon at the Augusta country club.



New Machine Tools and Shop Equipment

"Magnified and shaped in steel, here is the final energy, the seed that fertilizes space."
—MacKnight Black

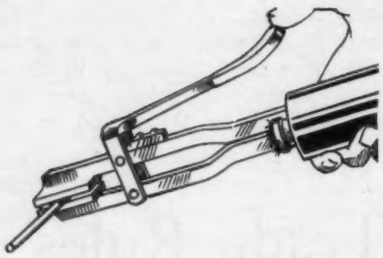
Electrode Holder Has Ventilated Handle

No. 101

Northwestern Mfg. Co., Milwaukee, Manufacturer of arc welders, is introducing a new metallic electrode holder which provides an unusual feature for the comfort of the operator. The handle of this new holder is round, fits the hand, and is ventilated so that it can be used continuously without becoming uncomfortably warm. The cable is held in place by a wedge, while current flows evenly and freely through both jaws.

Compression Lever Locked in Place

In place of the spring usually employed, the holder, shown in the accompanying illustration, makes use of a simple compression lever which is locked in place by a roller operating against a fixed ratchet. The jaws are made of pure copper and are welded in place. The gripping surfaces are free from corrugations and the rod is held in place securely at any desire angle. The holder may be obtained in sizes accomodating electrodes from 1/16 to ½ inch, inclusive, with currents up to 800 amperes.



No. 101—Electrode holder designed to improve operator's comfort

New Drive Chain Is Made of Alloy Steel

No. 102

Link-Belt Co., Indianapolis, is announcing the development of a new steel drive chain which is made from alloy steel, heat treated, and which uses a new type of pin and cotter. The pins, bushings and holes in side bars are accurately ground, manufacturing tolerances being held to 0.001-inch. The cotters are of a special type and are so designed as not to work loose when once inserted and swelled into the holes provided in the pins for their reception. The chain was developed to meet a growing need for a stronger and more durable type of chain for heavy positive power transmission. The smaller size is claimed to have an ultimate strength of 75,000

Iron Trade Review's Calendar of New Equipment

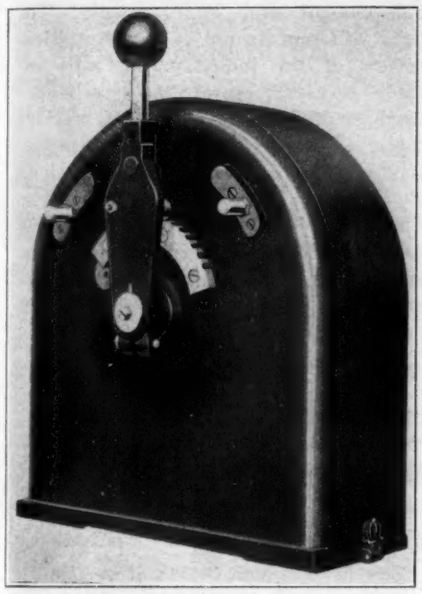
Item	Comment	Builder	No.	Date described	Page
Bandsaw tire	Can be changed with little time loss	Carter Products Co.	85	March 27	72
Automatic welder	Automatically welds brake cross shafts with carbon arc	Lincoln Electric Co.	86	March 27	72
Heat measuring device	Photoelectric cell quickly reads steel temperatures	Westinghouse Electric & Mfg. Co.	87	March 27	111
Flue cleaning machine	Automatic progression gives maximum efficiency	Joseph T. Ryerson & Son Inc.	88	March 27	111
Milling machine	Will cut through-slots in bars 9 inches in diameter	William K. Stamets	89	March 27	112
Coal pulverizer	Vertical shaft mill-type pulverizer has magnetic separator	Pulverized Fuel Equipment Co.	90	March 27	112
Press blank holder	Pneumatic holder built as integral part of press bed	Marquette Tool & Mfg. Co.	91	March 27	112
Timing device	Automatically controls electrohydraulic press	Terkelson Machine Co.	92	April 3	87
Surface grinder	Grinds both flat and vertical surfaces	Berea Machine & Tool Works	93	April 3	87
Die spotter	Operates on shop air supply; high accuracy	Marquette Tool & Mfg. Co.	94	April 3	87
Grinder attachment	Simplifies sharpening of face mills	Cincinnati Milling Machine Co.	95	April 3	88
Bending machine	For structural shapes; riveted and welded	Thomas Spacing Machine Co.	96	April 3	88
Tool housing	Electric tools provided with stronger housings	United States Electrical Tool Co.	97	April 3	88
Centrifugal accelerator	Hydromatic starter provides more uniform starting	Worcester Polytechnic institute	98	April 3	88
Pump	Two-stage, vertical type; no packing used	Ruthman Machinery Co.	99	April 3	89
Upsetting machine	Unusually large; has twin flywheels and twin gearing	Ajax Mfg. Co.	100	April 3	89
Electrode holder	Ventilated handle; has new clamping mechanism	Northwestern Mfg. Co.	101	April 10	80
Drive chain	For heavy-duty applications; made of alloy steel	Link-Belt Co.	102	April 10	80
Master switch	For use with magnetic contactor controller	Electric Controller & Mfg. Co.	103	April 10	81
Boiler water meter	Provides certain indication of water concentration	Elgin Softener Corp.	104	April 10	81
Circuit breaker	Trip-free from handle on overcurrent	General Electric Co.	105	April 10	81
Vacuum cleaner	Portable type for cleaning machinery, motors, etc.	Breuer Electric Mfg. Co.	106	April 10	81
Tractor shovel	¾-yard shovel capacity; full swing operation	Detroit Power Shovel Co.	107	April 10	81
Frequency converter	Provides special frequencies; operates on local power	Reliance Electric & Engineering Co.	108	April 10	82

pounds, while the larger size has an ultimate strength of 150,000 pounds.

Master Switch Built for Smooth Operation

No. 103

Electric Controller & Mfg. Co., Cleveland, is building a new master switch, the function of which is to regulate the control of a magnetic contactor controller. The switch, shown in the accompanying illustration, is intended for use on cranes, hoists, ore bridges, steel mill machinery, and other applications where full speed control is desired. Smooth operation of this switch is effected by the use



No. 103—Compactly constructed master switch giving convenient control

of ball bearings, the short throw of the operating handle, the absence of gears, and the fact that the contact fingers always ride on uninterrupted plane surfaces. Contributing to smooth operation also is an accurately machined, notched track on which an improved roller-type centering device rides. This permits the operator to feel distinctly the various speed points, the notch in the "off" position being machined more deeply than the others.

Steel Cover Protects Switch

The switch is entirely enclosed by a heavy-gage steel cover and is arranged for conduit connection. Its width has been made as small as possible, so that when several of these devices are mounted in a crane, cage or operator's pulpit, the operator can reach and operate them conveniently. The switch has a straight line lever operation, and can be mounted in the upright or the inverted position. A maximum of six points of speed control in each direction is available with overload reset at the "off" position.

Boiler Meters Eliminate Uncertain Control

No. 104

Elgin Softener Corp., Elgin, Ill., has designed a blow-down meter which is intended to eliminate all doubt and uncertainty for maintaining boiler water concentration. This instrument shows boiler concentration at a glance, directly in grains per gallon. It consists of a combination thermometer and hydrometer, the thermometer having a graduated scale from 80 to 100 degrees Fahr. The hydrometer scale, which reads directly in grains per gallon, is calibrated for every ten grains and has a range from 0 to 500.

Provides Laboratory Precision

The device provides laboratory precision with the practical simplicity of the boiler room, and can be used by any man who can read the water level in the gage glass. The blow-down meter makes it possible to determine the condition of the boiler water in a few minutes, and enables the operator to maintain boiler-concentration at the most desirable value, to minimize boiler blow-down without introducing any dangers to the boiler, and to reduce boiler control to a certainty.

Circuit Breakers Have Unusual Features

No. 105

General Electric Co., Schenectady, N. Y., has placed on the market a new line of air circuit breakers which are designed to be trip-free. The principal advantages claimed for these breakers are: They are trip-free from the handle on overcurrent; there is triple contact; there is no burning on the main brush; the burning tips are replaced easily; the high pressure main contact is formed of laminations which make "end-on" contact with heavy and uniform pressure and yet are closed easily with a wiping motion; and they have low operating temperature. The breakers are available for either instantaneous or time delay automatic operation in either single, double, or triple-pole combinations with necessary accessories.

A high-grade finish makes them applicable on building equipment switchboards. There are three classifications of breakers for voltages of 650 volts and below.

Vacuum Machine Cleans Mill Equipment

No. 106

Breuer Electric Mfg. Co., Chicago, recently has developed a new type industrial vacuum cleaner of the portable tank type, shown in the accompanying illustration. It is designed for heavy-duty work in cleaning machinery, motors, overhead pipes, girders, walls, floors and office rugs as well as many other industrial applications.

The cleaner employs an oversize 2/5-horsepower motor, mounted on a cast aluminum cover which fits over a steel tank finished in aluminum. A

No. 106—Vacuum cleaner for heavy-duty work in cleaning machinery, motors, overhead pipes, etc.

complete set of attachments is furnished to take care of all types of cleaning. A special feature is the possibility of removing the motor from the cover to be used as a portable blower. The cleaner is easily portable and has ample power.

Tractor Shovel Operates in Close Quarters

No. 107

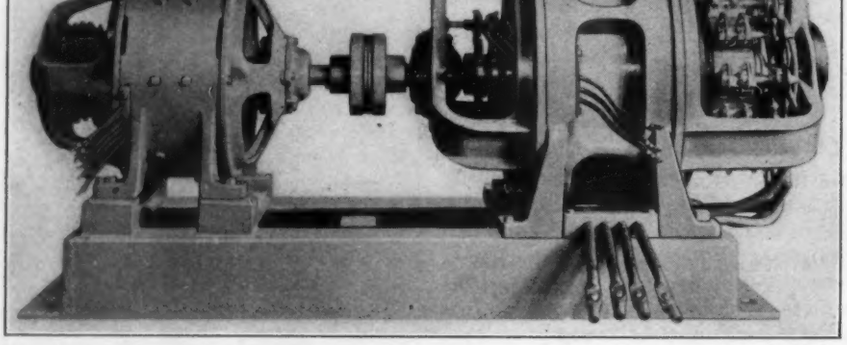
Detroit Power Shovel Co., Detroit, is manufacturing tractor power shovels for use where only a small shovel can handle the work. The tractor shovels are of the small ⅜-yard type, and have a full swing turntable with a stationary engine mounted on the other end of the frame. They are thus able to make a narrow 8-foot cut and at the same time load a truck located behind the shovel. This

feature is made possible by the hydraulic industrial clutch installed on the machines. The clutch, which is also a product of the company, permits flexibility in operation, and allows the shovel to remove material from what would ordinarily be inaccesible places.

Converters Provide Wide Frequency Range

No. 108

Reliance Electric & Engineering Co., Cleveland, is building special frequency converters for obtaining frequencies different from those furnished by power companies. These machines are built for operation on either two-phase or three-phase current. The frequency converters, one of which is shown in the accompanying illustration, provide a method of obtaining single-phase, two-phase or three-phase current at low frequency and are especially economical for obtaining low frequencies such as 3 to 15 cycles. These converters have been used to obtain variations in speeds with squirrel-cage induction motors and to get speeds which are either higher or lower than can be obtained from induction motors operating on standard frequencies.



No. 108—Frequency converter which provides special frequencies for industrial use from local power supply

Ohio Blast Furnace Now Being Enlarged

An important program of improvements is under way at the Riverside plant of the Otis Steel Co., Cleveland. The No. 2 blast furnace is being relined and new steel work installed below the mantle. One stove is being relined and Shea Whelpley checkers installed. The blast furnace is being slightly enlarged. The work is being supervised by the Freyn Engineering Co., Chicago.

Two new Chapman-Stein one-way continuous regenerative soaking pits equipped with Blaw-Knox preheaters have been built. This equipment has a capacity to take care of two additional soaking pits. Fuel burning equipment is being revamped including installation of two new waste-heat boilers in the open-hearth department. In the sheet mill miscellaneous equipment including continuous shears and an additional crane is being installed and in the strip mill equipment for handling coils.

Metal Trades Group Will Meet in New York

Major topics pertaining to industrial relations, business conditions, stabilization of employment, production methods, management policies and problems, safety, and kindred subjects of economic importance to the metal trades industry of the country, will comprise the program of the thirty-second annual meeting of the National Metal Trade association at Hotel Astor, New York, April 16-17. The association will hold a joint meeting with the National Industrial Conference board the afternoon of April 17 at which time the subject of "Management Problems in Handling Personnel" will be discussed, while at the evening dinner, business men lately returned from Russia will discuss the situation in that country. The technical program will include the following papers:

Wednesday, April 16

"Stabilization of Employment," by Samuel A. Lewisohn, vice-president, Miami Copper Co., New York.
"The Automobile Industry and Prosperity," by Alfred Reeves, manager, National Automobile Chamber of Commerce, Washington.
"Business Conditions," by George E. Roberts, vice-president, National City bank, New York.
"Value of Business Opinion in Congress," by Albert H. Vestal, congressman from Indiana.
"Essentials in Personnel Policies," by E. K. Hall, vice-president, American Telephone & Telegraph Co., New York.

Thursday, April 17

"Labor Conditions in the Electrical Industry," by Walter Gordon Merritt, counsel, League for Industrial Rights, New York.
"Relations of Management with Capital and Labor," by L. F. Loree, president, Delaware & Hudson railroad, New York.
"Industrial Education," by Harold Falk, Falk Corp., Milwaukee.

Revised Book To Contain Latest Steel Facts

Bridges with spans a mile long, overhead passways for busy motor traffic, houses manufactured on a production basis like automobiles, and artificial islands as ports for transoceanic airplanes, are some of the developments of the steel world included in a new *Fact Book* soon to be published by the American Institute of Steel Construction. This volume was first issued last year and the revision now being brought out, represents an enlargement and improvement. The book will contain not only a statistical review of the industry, but will include a directory of the steel contractors of North America, a bibliography of engineering literature, industrial motion pictures and stereoptican slides, and innumerable other data. The volume is intended as a handy reference for those writing or lecturing on steel construction, and as a guide for those who wish to make the acquaintance of original sources.

Convention Calendar

April 16-17—National Metal Trades association. Thirty-second annual convention at Hotel Astor, New York. J. E. Nyhan, Peoples Gas building, Chicago, is secretary.

April 22-23—National Machine Tool Builders' association. General cost conference at Hotel Cleveland, Cleveland. E. F. DuBrul, 1415 Enquirer building, Cincinnati, is general manager.

April 23-25—American Welding society. Annual meeting to be held at Engineering Societies building, New York. Miss M. M. Kelly, 33 West Thirty-ninth street, New York, is secretary.

May 1-3—American Gear Manufacturers association. Annual meeting at Hotel Gibson, Cincinnati. T. W. Owen, 3608 Euclid avenue, Cleveland, is secretary.

May 5-7—National Pipe and Supply association. Annual meeting at Carolina hotel, Pinehurst, N. C. R. Kennedy Hanson, 914 Clark building, Pittsburgh, is secretary.

May 9—Rail Steel Bar association. Semi-annual meeting at Commodore hotel, New York. H. P. Bigler, 228 N. LaSalle street, Chicago, is secretary.

May 9—American Iron and Steel institute. Spring meeting at Commodore hotel, New York. E. A. S. Clarke, 75 West street, New York, is secretary.

May 12-17—American Foundrymen's association. Annual convention at Public Auditorium, Cleveland. C. E. Hoyt, 222 West Adams street, Chicago, is secretary.

May 16-17—National Hardware Association of the United States. Nineteenth annual meeting of the metal branch at Clifton House, Niagara Falls, Ontario. George A. Fernley, 505 Arch street, Philadelphia, is secretary.

May 19-20—American Refractories institute. Annual meeting at Greenbriar hotel, White Sulphur Springs, W. Va. Dorothy A. Texter, 2218 Oliver building, Pittsburgh, is secretary.

May 21-23—National Foreign Trade council. Convention at Hotel Biltmore, Los Angeles. O. K. Davis, 1 Hanover Square, New York, is secretary.

May 26-28—American Boiler Manufacturers association. Semiannual meeting at Skytop Lodge, Cresco, Pa. A. C. Baker, 801 Rockefeller building, Cleveland, is secretary.

Editorials

Tungsten Carbide Gaining Popularity

CEMENTED tungsten carbide has passed the stage of infancy as a cutting material and now is entering a rugged adolescence. Many overstatements and no doubt some misstatements have been made as to its capabilities, however, it is now generally realized that despite the revolutionary savings effected in much machining work there are some cutting operations for which the alloy is not suitable. A general understanding of what the material will do and will not do can serve only to stimulate its further usage.

Determination of proper angles, rakes and clearances for tungsten carbide tools and of a satisfactory method of grinding the superhard material is proving helpful. The article on Page 71 of this issue of IRON TRADE REVIEW presents this pertinent information and will be found of much value to those not thoroughly familiar with the new high production alloy. An important recent development has been the introduction of tools in which the tungsten carbide tip is held mechanically in the steel tool shank instead of being welded or brazed to the shank. A tool of the newer type is claimed to be capable of handling heavy work heretofore considered too severe for brazed or welded tools but well within the cutting capacity of tungsten carbide itself.

Grinding has constituted another difficult problem in connection with tungsten carbide because of the extreme hardness of the alloy. Wheels of special grain and hardness are required, but abrasives manufacturers have been successful in perfecting wheels sufficiently hard to perform all grinding operations satisfactorily. The base material of these wheels in most cases is silicon carbide and tools may be ground wet or dry.

Do Not Arm La Guardias!

SCARCELY was the ink dry on the lead editorial of last week's issue of IRON TRADE REVIEW, warning of a critical attitude at Washington toward mergers, when Representative F. H. La Guardia, of New York, arose in the house to attack the proposed sale of the Youngstown Sheet & Tube Co. to the Bethlehem Steel Co. and demand that the attorney general initiate an investigation.

In less than a week Representative La Guardia has announced that the representations of the department of justice that it is watching every move of the merger are satisfactory to him, and that he will not press his resolution. This decision confirms the early judgment that the resolution probably was for public consumption. No one with any background of the steel situation in the Middle West takes his charges seriously. To be sure the United States Steel Corp. is vitally interested in the development of its largest competitor, but few believe it is an active partisan behind the scenes. It is difficult in this day of diffused ownership and public interest to visualize New York at the mercy of the Steel corporation and Bethlehem.

Nevertheless, it is just such impressions as Representative La Guardia has voiced that the iron and steel industry must avoid. Regardless of the logic of mergers, consummated or proposed, and the steel industry's urgent need for stability, there is a growing body of opinion in the country that the tendency toward mergers is inimical to the average consumer. In self defense the administration at Washington may be forced into a position it would avoid. It cannot be too strongly urged that all industry tread softly and attempt to placate a rising hostility.

Scrap Signal Now Amber, Not Green

SIGNS of a substantial improvement in steelmaking in the near future are lacking in the iron and steel scrap market. The recent listlessness in mill purchases of scrap, attended by declining prices, lends support to the belief that what upturn is in store for steel production during April will be moderate in character.

Heavy melting steel at Pittsburgh was in a declining market from early September, 1929, to December of that year. Higher prices accompanied a stronger demand during the latter month and the market rose sharply $2 a ton by the middle of January. Since that time scrap has reflected the failure of steelmaking operations to hold its early gains and the price trend has been steadily downward. The near future outlook for steel demand has lacked definiteness for several weeks, and mills have curtailed scrap purchases.

Scrap prices are not infallible as a barometer of the early trend in steel activity since they merely reflect the judgment of mills as to their

probable consumption of old material, and special circumstances may serve to alter these requirements on short notice. Scrap supplies recently have been only moderate, however, the output of a number of scrap producing industries having been restricted, so that prices are more susceptible than otherwise to improvement in buying. The current dullness in the market tone, however, attests to the hesitancy that gives indications of continuing in the steel industry for at least the next several weeks.

Continuous Mills Depress Composite

LAST week the IRON TRADE REVIEW composite of fourteen leading iron and steel products declined to $34.57, the lowest point it has touched since late March, 1922. This index faithfully reflects a weak price situation, induced by a level of demand considerably below 1929, and one that has steadily deteriorated since the beginning of the year. For January the average was $35.56, for February $35.24, for March $34.95.

Relatively, pig iron prices have declined less precipitately than finished steel, and for the logical reason that the pig iron market is more closely held and there is an increasing number of quiet transactions, which usually carry a concession from the quoted levels. Analyzing the trend in steel, it is readily evident that the heavy finished lines are about on a parity with 1928—paralleling the state of demand—while the greatest weakness is apparent in the flat rolled lines.

Revised bases on blue, black and galvanized sheets render comparisons difficult, but on the whole it may be accurately said that sheet prices today are the lowest since 1922. This also is true of strip, hoops and bands. It is in these products that continuous rolling processes have made such strides. To what extent the price situation reflects excess capacity or bona fide reductions in costs owing to more rapid production is difficult to segregate. It does, however, indicate a new basis for values which the industry is beginning to recognize in revisions of extras.

Pennsylvania a Nation in Itself

PENNSYLVANIA—there she stands! So, on digesting the American Iron and Steel institute's analysis of pig iron production for 1929, might Senators Reed and Grundy aptly paraphrase Webster.

Oblivious to the apparent westward trend of industry and unmoved by the efforts of iron and steel producers to acquire facilities in the Chicago district, the Keystone state proceeds to maintain its supremacy in pig iron.

In 1929, when all records were broken, Pennsylvania turned in an output of 14,453,251 gross tons of iron, or 33.57 per cent of the country's total. Over 1928 this was an increase of 16.29 per cent for Pennsylvania, while the country as a whole was expanding only 11.65 per cent.

What a picture of industry contemplation of the Ruhr of Germany or the "black country" of England presents, yet Pennsylvania is mightier than any nation. Contrast the 14,453,251 tons of Pennsylvania last year with the 13,300,000 tons produced by all the furnaces of Germany, the 10,290,000 tons of France, the 7,565,000 tons of Great Britain, the 4,035,000 tons of Belgium and the 2,850,000 tons of Luxemburg.

No wonder Senator Grundy is disposed to believe that some of the "backward" states industrially should "talk small."

America a Scrap Reservoir

INTERNATIONAL trade in iron and steel scrap is coming to be an important factor in industry and governments are interesting themselves to a greater extent than ever before. No better index of the growing importance of this reclaimed material can be found than the fact that its export is being included in trade treaties as a matter of moment.

Countries not possessed of iron ore reserves or lacking in smelting facilities are seeking agreements with more fortunate nations for the importation of important tonnages and are forbidding export of their own reclaimed tonnage.

Poland and Germany have just completed a trade treaty which allows the importation of 165,000 tons of scrap annually from Poland to Germany and the export from Poland of 50,000 tons of rolled steel products for German use.

Italy is seeking scrap from whatever place it can be obtained. Countries adjacent to Italy have limited scrap exports to that nation, to conserve their own supply. Argentina, devoid of ore or steelmaking facilities, has forbidden any export of scrap. Most of that formerly sent out from the valley of the Plate went to Italy, and the tonnage available there is thus reduced.

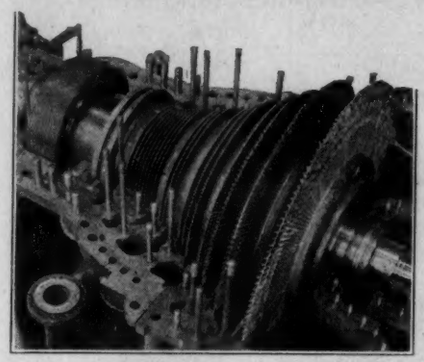
A recent report by government observers showed exports of more than 500,000 tons annually from the United States, moving to Italy, Japan, Poland, to supply their deficiencies from our abundance. Yet this tonnage moved from locations remote from steel centers and could not have been shipped economically by land for domestic use.

With tightening of exports from other countries it would seem likely that American scrap may become more and more sought by Europe and the Orient. The excess from border areas will supply that need for long.

IRON TRADE REVIEW

Volume 86, Number 15 — Published Every Thursday

E. L. SHANER, Editor. — *J. D. PEASE, Advertising Director.* — *F. F. LIGHT, Circulation Manager.*



Corrosion Resisting Steel Now Used for Turbine Blades. Page 59.

Gives Facts on Tungsten Carbide Cutting Tools

THE manufacture of tungsten carbide cutting tools for some time has been on a production basis and considerable experience has been gained in the use of the tools. Makers have taken the initiative in studying the properties of tungsten carbide, one of the hardest substances known, and users have been no less eager in their desire for more facts pertaining to its application. They have wanted to know correct angles, rakes, clearances and grinding procedure for the tools, and this is the kind of information set forth in the article beginning on page 71. The author is metallurgical engineer for one of the leading manufacturers, and he sums up knowledge acquired through considerable research. The second and concluding part of his article will appear in an early issue.

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IRON TRADE REVIEW is published by the Penton Publishing Co., Cleveland, O. Member, Audit Bureau of Circulation; Associated Business Papers Inc. and National Publishers Association. Branch offices: 1347 Peoples Gas Bldg., Chicago; 505 Bell Block, Cincinnati; 2203-2206 No. 220 Broadway, New York; 2148-49 Oliver Bldg., Pittsburgh; 1703-11 Claus Spreckels Bldg., San Francisco; 1658 Pennsylvania avenue, Washington; and Boston Foreign offices: Caxton House, Westminster S. W. 1, London; 9 Rue de Londres, Paris, France; Dahlmerstrasse 64A Berlin Lichterfeld-West, Germany; cable address: *PENTON*, Cleveland; *IROTRAPEN*, London. Terms: Subscription in United States, Cuba and Mexico, $6 per year; in Canada, $8.50 per year and in Great Britain and other countries £2:0:0 per year. *Entered at the Post Office at Cleveland as Second Class Matter.*

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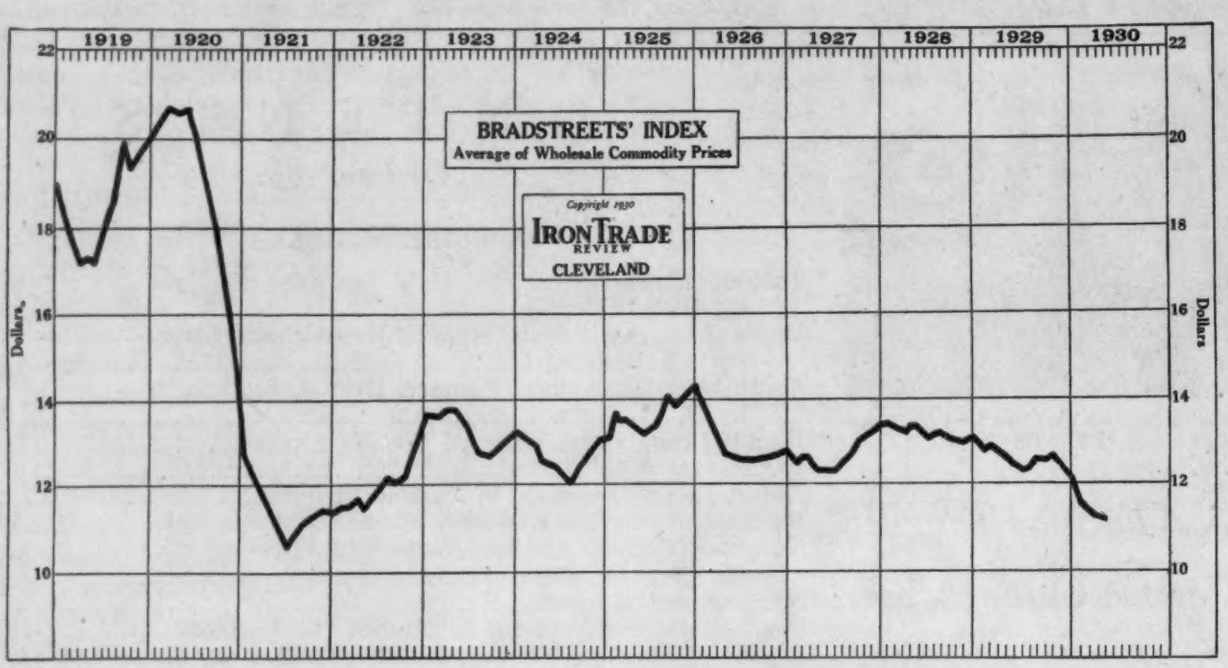
The Business Trend



Decline In Commodity Prices Slackens

IN THE basic industries stocks in some cases are unusually large despite curtailed outputs. Stocks of copper, zinc, petroleum and various other commodites have increased even in the face of reduced production. Herein lies the reason for the continued decline of wholesale commodity prices. The continued presence of relatively large stocks also explains the lagging rise of industrial production, indicating that adjustment to demand still is out of gear.

WHOLESALE prices, as measured by Bradstreet's index, declined only three-tenths of 1 per cent during March. This drop was not as great as in previous months, strengthening hopes that a turn may be near. The *Annalist's* index now has advanced for two consecutive weeks—another hopeful sign. Bradstreet's monthly index as of April 1 was $11.18 compared with $11.22 one month before and $12.87 one year ago. Wholesale prices have been declining for six consecutive months and now are the lowest in nine years.

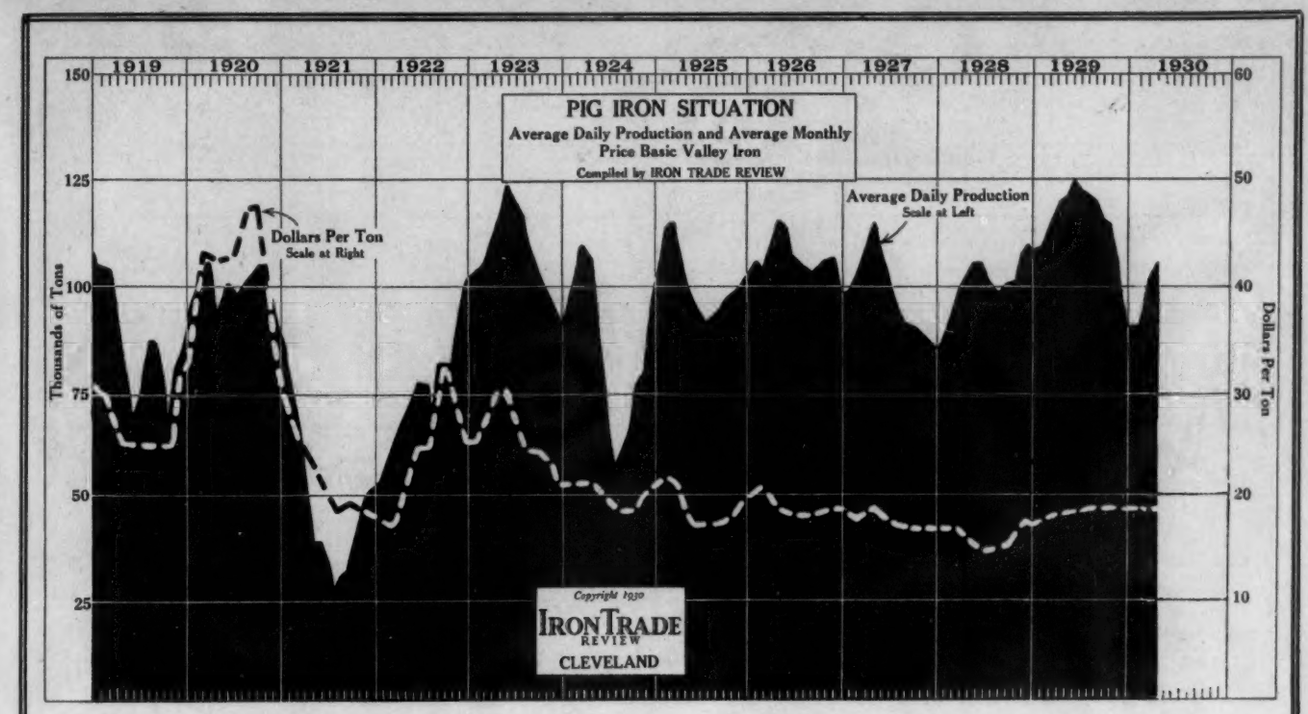
UNDOUBTEDLY the business situation is improving but surplus stocks and low price levels are bars that are not hurdled quickly. Spotty conditions such as now exist in industry are characteristic of periods of recovery.

APRIL is presenting signs of marked improvement in steel production, in automotive production, in building construction and in retail trade. The arrival of spring is dispelling the spirit of pessimism although caution continues to be the watchword of business.

RECOGNITION of the fact that current improvement is partly seasonal will keep hopes modestly in check. The early spring months still are quite likely to be followed by a rather slow summer with a real upturn in industrial activities probable during the later months of the year. Prospects for agriculture still are uncertain, if not distinctly unfavorable, unemployment may not be fully relieved for many months, profit margins in industry are narrow, dividends are being paid less freely and freight car loadings are the lowest for the season since 1922, reflecting lessened consumption of both raw materials and finished goods.

COMMERCIAL failures have increased and unemployment has been widespread. Yet there has been lacking evidence of dire distress usually characterizing previous periods of business depression. Thus the foundations of prosperity do not seem seriously damaged nor do repairs present any unusual difficulties.

The Business Trend

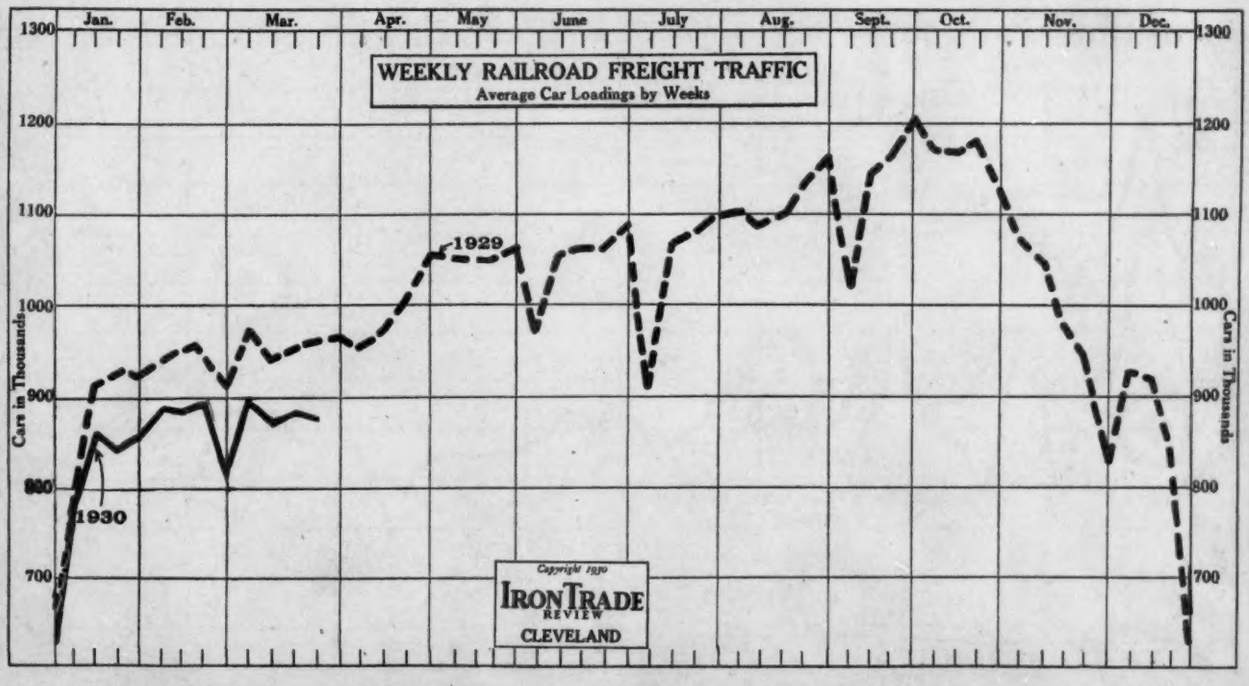


Pig Iron Situation

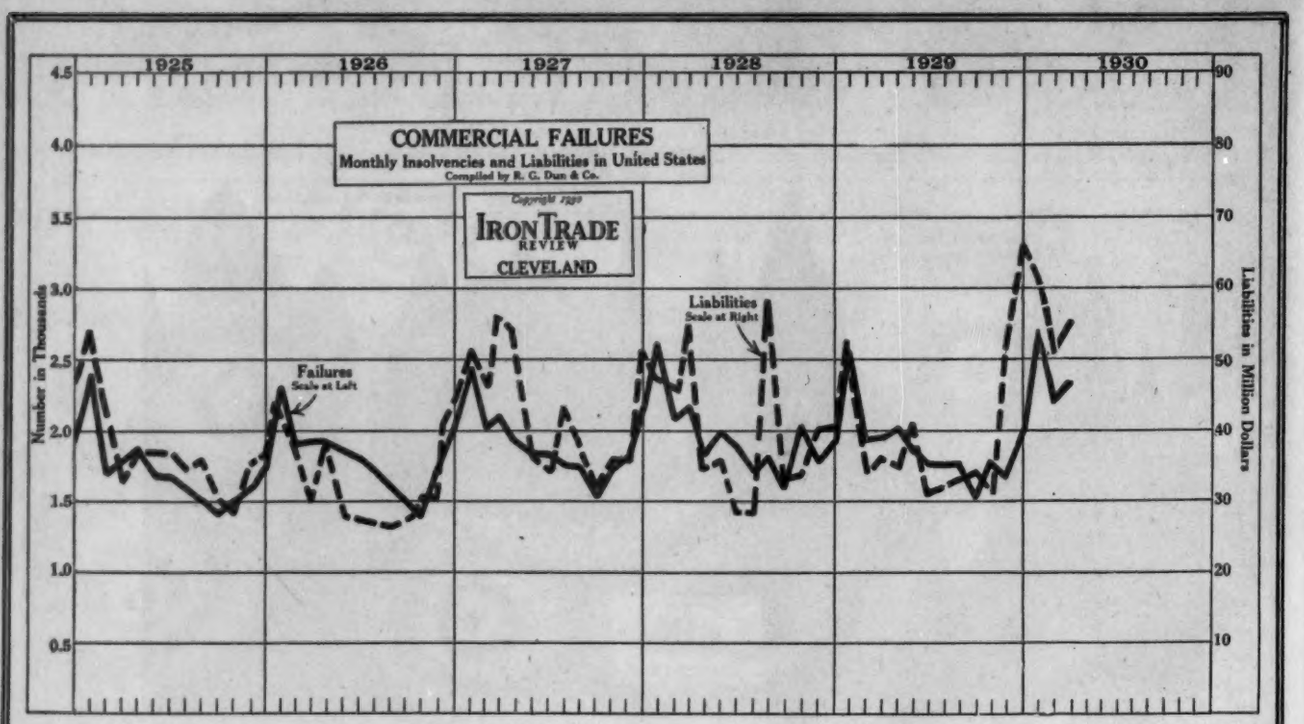
FOR the third consecutive month the rate of pig iron output last month increased, averaging 105,520 gross tons daily compared with 101,640 tons in February and 91,573 tons in January. The March increase was 3.9 per cent compared with the previous month although the daily rate fell 12 per cent short of the 119,662-ton mark of last March. In March, 1928, output averaged 103,-199 tons. Despite fluctuation in production, the price of basic pig iron for nearly a year has held at $18.50, valley.

Freight Car Loadings

FREIGHT car loadings, the best of all measures of current consumption, totaled 875,-542 cars for the week ended March 22 compared with 881,187 cars in the previous week and 962,400 cars in the corresponding week of last year. This shows that the railroads are carrying about 9 per cent less in freight volume than one year ago. Loadings are the lowest for this season in about eight years. Decreases are shown in all commodities except miscellaneous freight, ore and coke. Seasonal gains are in prospect.



The Business Trend

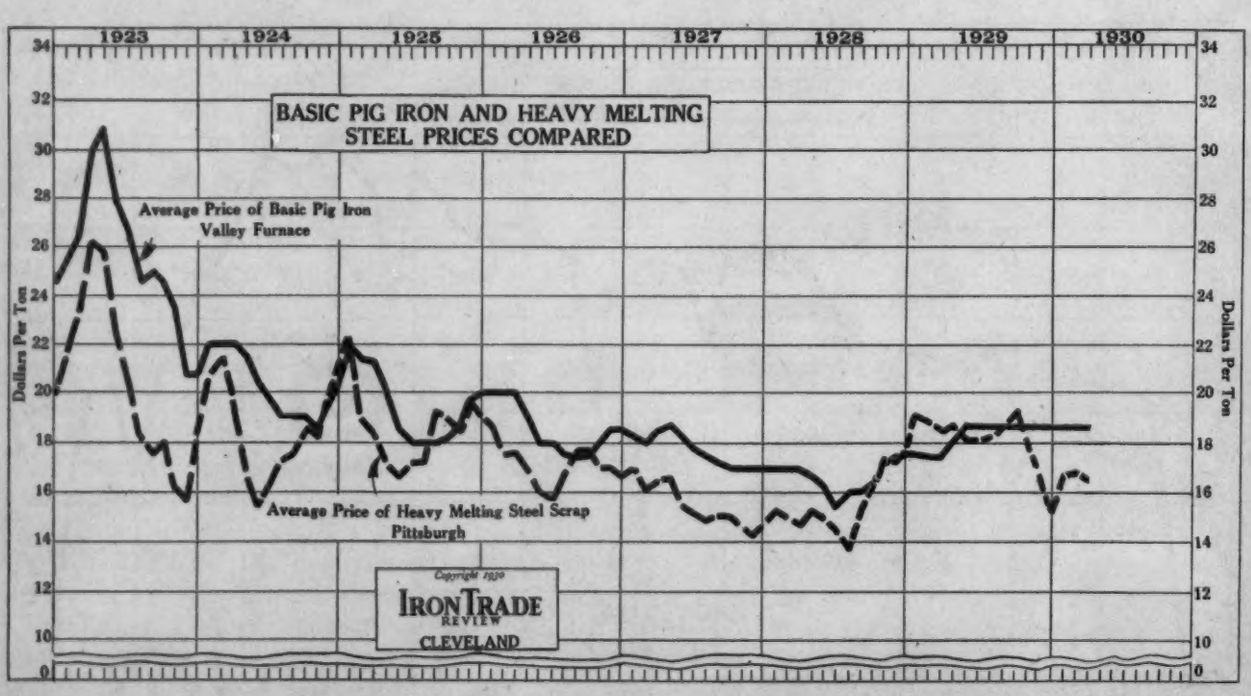


Commercial Failures

BUSINESS failures in March registered a 4 per cent increase compared with those for February, numbering 2347 against 2262 in the previous month and 1987 in March, 1929. The increase was greater than usually shown at this season and most unsatisfactory numerically for the season back to 1922. March liabilities totaled $56,846,015, a 11 per cent increase compared with the $51,326,365 total for February. Liabilities for March, 1929, amounted to $36,350,000. In several March periods liabilities have been larger.

Steel Scrap Prices

FAILURE of steelmaking operations to expand as much as anticipated contributed to a decline in prices of steel scrap last month. Heavy melting steel scrap, after having advanced in January and February, declined in March, the month's average price for No. 1 scrap at Pittsburgh standing at $16.62½ a ton compared with $16.87½ for February. The quotation on basic pig iron continued unchanged during March at $18.50, valley furnace. The spread between scrap and basic iron thus is widened.



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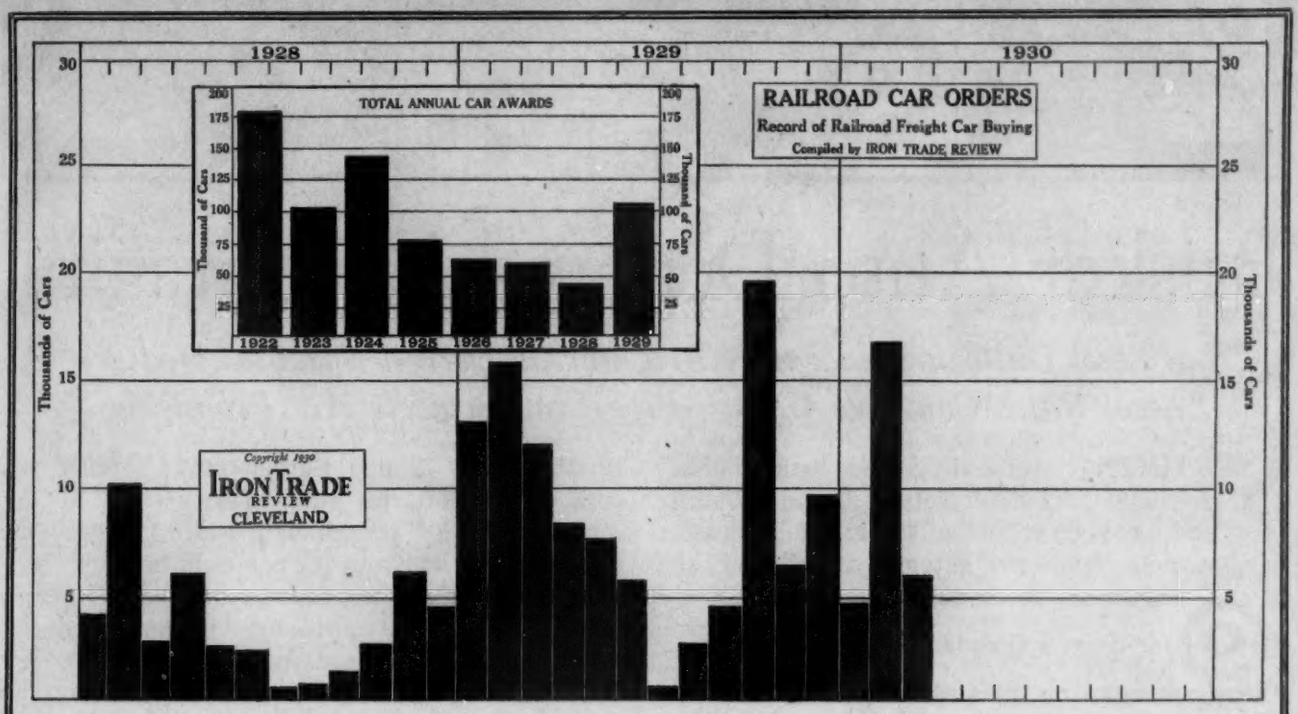
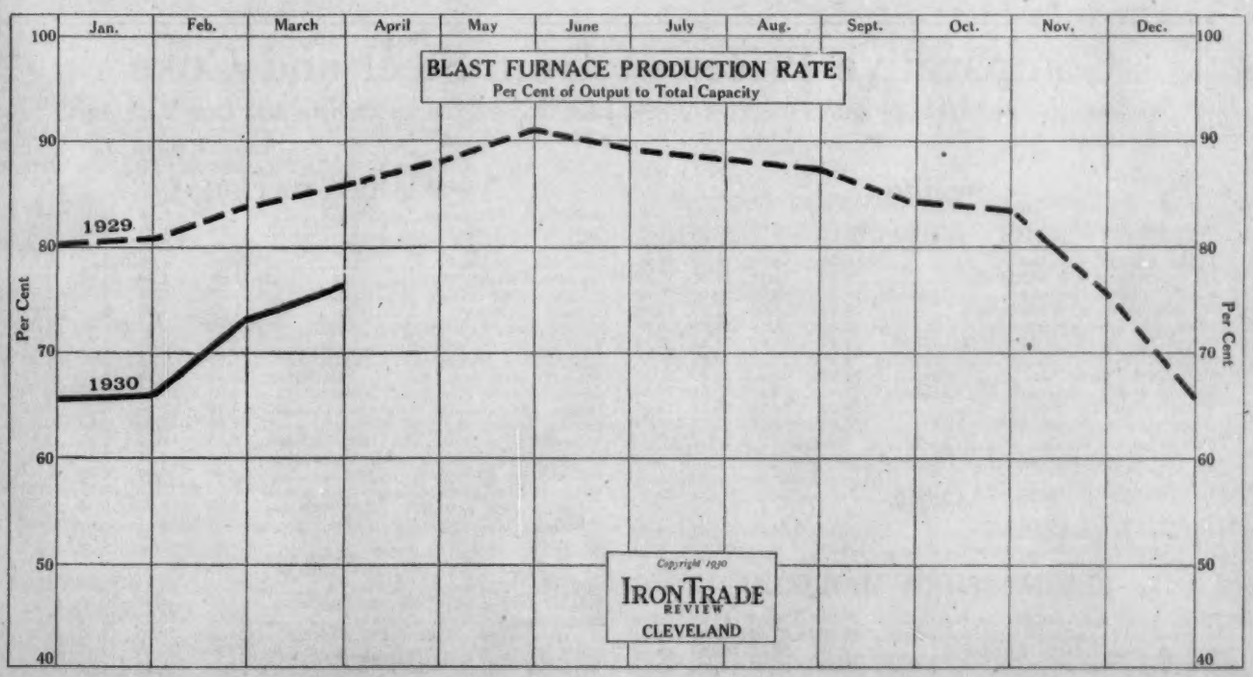


Railroad Car Orders

FREIGHT car orders in March totaled 6001, representing fair business for this month although nearly 11,000 less than the February total of 16,921 cars. Domestic freight car awards for the first three months of 1930 totaled 27,888 compared with 41,163 in the corresponding quarter of 1929. This year's first quarter total was larger than that of any other first quarter in recent years, that for 1929 excepted. With the carriers now seeking bids on several large orders, April promises to be a good car buying month.

Blast Furnace Activity

BLAST furnace activity measured by monthly output of all furnaces in relation to capacity increased slightly in March and at the close of the month was back almost to the level of last November, which was 76.9 per cent. The March rate was 76.5 per cent and compares with 73.7 per cent for February and 66.3 for December, the low point of the recent record. As of March 31 there were 183 of the country's 314 available stacks on the active list, or 58 per cent of the total. This was four more than on Feb. 28.



Brisker Auto Demand Encouraging

Iron, Steel Outlook Moderately Brighter as Detroit Specifies Heavier—Steel Rates Continue Gains—Pipe Line Projects Are Promising

SENTIMENT in the iron and steel industry continues to outrun actual demand, but its lead has been cut down somewhat by heavier specifications from the automotive industry and a slight acceleration in general buying.

Hopeful for Second Quarter

Requirements of the railroads, structural fabricators and general manufacturing trade have been only moderately below a year ago and for the past three weeks have been expanding slightly. To the automotive industry is traceable the major share of the spread between this and last year's situation.

Now that a definite, although conservative, upward trend is discerned at Detroit, iron and steel producers look for gradual improvement in their position this quarter. This week they have increased their operations to 77 per cent, compared with 76 last week and 74 two weeks ago.

Youngstown mills at 70 per cent and Cleveland at 76 each have recorded gains of 2 points. Chicago mills are holding at 90 to 95 per cent, Pittsburgh at 75 and Buffalo at 77. Steel corporation subsidiaries this week are at 84 per cent, against 83 a week ago, while independents have stepped up from 69 per cent to 70.

Disclosure that steel ingot operations in March declined 2 per cent, contrasted with an increase of 4 per cent in pig iron, is not disquieting in view of the steady but slow expansion thus far in April. March's ingot rate was 164,916 gross tons, compared with 169,499 tons in February and 194,548 tons last March. The March total of 4,288,985 tons brings the first quarter production to 12,143,406, contrasted with 13,874,612 tons a year ago.

Believe Scrap Is Near Bottom

Finished steel prices continue spotty, with no noticeable accession of strength through increased demand. For attractive orders producers of most lines continue willing to make concessions. Sheets and strip still are relatively weaker than the heavy finished lines, with open reductions in sheets at Chicago. Iron and steel scrap prices

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	April 9, 1930	March 1930	Jan. 1930	April 1929
PIG IRON				
Bessemer, del. Pittsburgh	$20.76	20.76	20.76	20.26
Basic, valley	18.50	18.50	18.50	18.00
Basic, eastern, del. eastern Pa.	18.76	18.80	19.20	20.25
No. 2 foundry, del. Pittsburgh	19.76	19.76	19.76	19.86
No. 2 foundry, Chicago	19.50	19.50	20.00	20.00
*Southern No. 2, Birmingham	15.00	14.50	14.70	15.50
**No. 2X, Virginia Furnace	18.25	18.25	18.25	20.75
**No. 2X, Eastern del. Philadelphia	20.76	20.76	21.56	22.26
Malleable, valley	19.00	19.00	19.00	18.50
Malleable, Chicago	19.50	19.50	20.00	20.00
Lake Superior, charcoal, del. Chicago	27.04	25.04	27.04	27.04
†Gray forge, del. Pittsburgh	19.13	19.13	19.13	19.36
Ferromanganese, del. Pittsburgh	103.79	103.79	104.79	109.79

*1.75 to 2.25 silicon. For local delivery. Northern shipments based on $13 to $14, Birmingham. **2.25 to 2.75 silicon.

COKE				
Connellsville furnace, ovens	2.60	2.60	2.55	2.75
Connellsville foundry, ovens	3.50	3.50	3.50	3.75
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngstown	33.00	33.00	33.80	35.00
Sheet bars, open-hearth, Pittsburgh	33.00	33.00	33.80	35.25
Billets, open-hearth, Pittsburgh	33.00	33.00	33.80	34.50
Wire rods, Pittsburgh	38.00	38.00	40.00	42.00

	April 9, 1930	March 1930	Jan. 1930	April 1929
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.80	1.85	1.90	1.95
Steel bars, Chicago	1.90	1.90	2.00	2.05
Steel bars, Philadelphia	2.12	2.12	2.17	2.27
Iron bars, Chicago	1.95	1.95	2.00	2.05
Shapes, Pittsburgh	1.80	1.80	1.90	1.95
Shapes, Philadelphia	1.81	1.81	1.91	2.06
Shapes, Chicago	1.90	1.90	2.00	2.05
Tank plates, Pittsburgh	1.80	1.85	1.90	1.95
Tank plates, Philadelphia	2.00	2.00	2.05	2.15
Tank plates, Chicago	1.90	1.90	2.00	2.05
*Sheets, blue anl., No. 13, Pittsburgh	2.25	2.25	2.30	2.15
Sheets, black, No. 24, Pittsburgh	2.65	2.65	2.70	2.90
Sheets, gal., No. 24, Pittsburgh	3.30	3.30	3.35	3.65
Sheets, black, No. 24, Chicago	2.80	2.80	2.90	3.10
*Sheets, blue anl., No. 13, Chicago	2.40	2.50	2.50	2.35
Sheets, galvanized, No. 24, Chicago	3.45	3.45	3.55	3.85
Plain wire, Pittsburgh	2.40	2.40	2.40	2.50
Wire nails, Pittsburgh	2.30	2.30	2.35	2.65
Tin plate, per base box, Pittsburgh	5.25	5.25	5.25	5.35

*Comparison for April, 1929, is with old blue annealed base, No. 10.

SCRAP				
Heavy melting steel, Pittsburgh	16.00	16.60	16.55	18.60
Heavy melting steel, eastern Pa.	14.25	14.95	14.50	17.00
Heavy melting steel, Chicago	13.00	13.20	12.65	15.95
No. 1 wrought, eastern Pa.	15.25	15.25	15.25	16.25
No. 1 wrought, Chicago	13.50	13.50	13.40	16.65
Rails for rolling, Chicago	15.00	15.00	14.65	17.50

Current Prices for Rolled Steel Products

STEEL PLATES

Pittsburgh, base	1.80c to 1.85c
Philadelphia, del.	2.00c
New York, del.	2.025 to 2.075c
Boston, del.	2.165c to 2.265c
Chicago, base	1.90c to 2.00c
Cleveland, delivered	2.04c
Lackawanna, N. Y., base	1.90c to 1.95c
Birmingham, base	1.95c to 2.00c
Coatesville, Pa., base	1.90c
Pacific Coast, c.i.f.	2.30c
St. Louis, del.	2.17c
Detroit, del.	2.09c to 2.14c

STRUCTURAL SHAPES

Pittsburgh, base	1.80c to 1.85c
Philadelphia, del.	1.81c to 1.91c
New York, del.	1.995c to 2.045c
Boston, del.	2.165c to 2.265c
Chicago, base	1.90c to 2.00c
Cleveland, delivered	2.04c
Lackawanna, N. Y.	1.90c to 1.95c
Birmingham, base	1.95c to 2.00c
Bethlehem, Pa., base	2.00c to 2.10c
Pacific Coast, c.i.f.	2.35c
Detroit, del.	2.09c to 2.14c

BARS

SOFT STEEL

Pittsburgh, base	1.80c to 1.85c
Chicago, base	1.90c to 2.00c
Birmingham, base	1.95c to 2.00c
Lackawanna, N. Y., base	1.95c to 2.00c
Pacific Coast, c.i.f.	2.35c
Cleveland base, local mills	1.80c to 1.85c
Cleveland, del., outside mills	1.85c
Philadelphia, del.	2.12c to 2.17c
New York, delivered	2.14c to 2.19c
Boston, delivered	2.165c to 2.265c
Detroit, del.	2.085c
Pittsburgh, cold finishing	1.90c to 2.00c
Pittsburgh, forging quality	2.05c to 2.10c

RAIL STEEL

Chicago Heights	1.85c
Eastern mills	1.85c to 1.95c

IRON

Chicago, base	1.95c
New York, delivered	2.07c
Philadelphia, delivered	2.07c to 2.12c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pittsburgh, billet cut lengths	2.10c
Stock lengths from mill	1.85c
Chicago, billet, 30 tons and over	2.00c
Under 30 tons	2.40c
Chicago, rail steel	1.75c
Road and bridge work	1.75c
Philadelphia, cut lengths	2.32c to 2.52c

CORROSION, HEAT RESISTANT ALLOYS

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel

Sheets....35.00c; plates....31.00c; bars....28.00c

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	22c	23.5c	26c	31c
Sheets	26c	27.5c	30c	35c
Hot strip	19c	20.5c	23c	28c
Cold strip	28c	29.5c	32c	37c

Carbon 0.12 and under; no nickel. A has chrome 15% and under, B over 15/18% inc., C over 18/23% inc., D over 23/30%.

SHEETS

SHEET MILL BLACK, NO. 24

Pittsburgh, base	2.65c
Detroit, delivered	2.84c
Philadelphia, delivered	2.97c
Gary, Indiana Harbor	2.75c
Chicago, delivered	2.80c
Birmingham, base	2.80c
St. Louis, del.	3.07c

TIN MILL BLACK NO. 28

Pittsburgh, base	2.80c to 2.90c
Gary, base	2.95c to 3.05c

GALVANIZED NO. 24

Pittsburgh, base	3.30c
Philadelphia, delivered	3.62c
Gary, Indiana Harbor	3.40c to 3.50c
Chicago, delivered	3.45c to 3.55c
Birmingham, base	3.45c to 3.55c
St. Louis, del.	3.72c

BLUE ANNEALED SHEETS NO. 13

Pittsburgh, base	2.25c
Chicago, district mills	2.35c
Chicago, delivered	2.40c
St. Louis, delivered	2.57c
Philadelphia, delivered	2.57c
Birmingham	2.40c

BLUE ANNEALED PLATES, NO. 9-10

Pittsburgh, base	2.10c
Chicago district mills	2.20c
Chicago, delivered	2.25c
Philadelphia, delivered	2.42c
St. Louis, delivered	2.42c
Birmingham	2.25c

AUTOMOBILE NO. 20

Pittsburgh, base	3.80c
Detroit, delivered	4.09c

FURNITURE NO. 24

Pittsburgh	3.90c

(Turn to the following page)

are softer, but there are more indications that bottom is near. Pig iron quotations are steady.

Plate business markedly dominates the heavy finished lines. At Chicago nearly 7000 tons will be required for Texas and Oklahoma refinery orders. Car builders' specifications still are heavy, with promise that a New York Central inquiry for posibly 10,000 and an Illinois Central inquiry for 2330 cars will augment the 1300 now pending from various roads.

Pipe line projects, also large outlets for plates, include 10,000 tons booked by the Republic, 4500 by the Smith and 3700 by the Youngstown companies. The 200,000-ton Texas-Chicago pipe line, at least half of which is expected to be placed at Chicago, seems near placement.

Larger releases for sheets, especially autobody, are giving the sheet mills more momentum. Ford, Chevrolet, Hupp, Willys-Overland and Chrysler have specified heavier. Ford steel mills are booked full, and excess requirements for bars are being distributed.

Structural Awards Fall Below 1929

Sales of fencing are improving, but manufacturers' wire is moving slowly for the season. Another attempt to stiffen prices of wire products is under way. In structural steel orders bridge work is outstanding, while the absence of industrial work is conspicuous. Structural awards this week, at 30,520 tons, compare with 25,617 tons last week and 78,831 tons placed in the same week a year ago.

Pig iron sales are brisk, including 23,000 tons at St. Louis, 10,000 tons at New York, and 7000 tons at Boston, but accent now is on shipments, which at Cleveland are the heaviest since November and at Birmingham are being made from stock. Some quiet closing is reported at Pittsburgh.

Lake Ore Sales Develop Slowly

Dullness in the Lake Superior iron ore market, an unusual condition following the opening last week when the Ford Motor Co. placed 441,000 tons at 1929 prices, is attributed to uncertainties engendered by merger talk in the Middle West. The first shipments are expected about April 20.

First quarter bookings of steel plates, reinforcing bars, structural shapes and cast iron pipe in the Pacific Northwest, at 30,252 tons, showed a 25 per cent increase over the opening quarter of 1929.

European markets are described as dull and stagnant. German blast furnace interests are holding up receipt of foreign iron ore. French demand largely reflects the inactive automotive industry. Improvement in tin plate is the exception to a quiet situation in the British industry.

Composite Market Averages

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

This week (April 9, 1930)	$34.52
Last week (April 2, 1930)	34.57
One month ago (March, 1930)	34.95
Three months ago (January, 1930)	35.56
One year ago (April, 1929)	36.81
Ten years ago (April, 1920)	67.49
Fifteen years ago (April, 1915)	22.66

A decline of 5 cents in the IRON TRADE REVIEW composite of 14 leading iron and steel products lowers this index to $34.52, compared with an average of $34.95 for March and $36.81 registered in April, last year.

Current Rolled Steel Prices

PRICES IN CENTS PER POUND UNLESS OTHERWISE INDICATED

Tubular Products Quoted on Last Editorial Page—See Preceding Page For Other Products

HOOPS, BANDS, STRIPS

Hot strip, to 6-in., Pitts.	1.80c to 1.90c
Delivered Detroit	2.09c
Hot strip 6 1/8 to 24-in., Pitts.	1.70c to 1.80c
Delivered Detroit	1.99c
Hot strip, bands 6 in. and under, Chicago	2.00c
Do. 6 1/8 to 24	1.90c
Cooperage stocks, Pittsburgh	2.00c to 2.10c
Do, Chicago	2.10c to 2.20c
Cold rolled strip, hard coils, 16 inches and under by 0.100-inch and heavier, base Pitts., Cleve. (3 tons and over)	2.55c to 2.65c
Delivered, Detroit	2.785c to 2.885c
Worcester, Mass. (3 tons and over)	2.80c to 2.90c

ALLOY STEEL

Hot Rolled—F.o.b. Mills

Alloy Quality Bar Base is 2.65c

S.A.E. Series Number	Alloy differentials	Net 100 lb. bars
2000	0.25	$2.90
2100	0.55	3.20
2300	1.50	4.15
2500	2.25	4.90
3100	0.55	3.20
3200	1.35	4.00
3300	3.80	6.45
3400	3.20	5.85
4100 0.15-0.25 Mo.	0.50	3.15
4100 0.25-0.40 Mo.	0.70	3.35
4600 0.20-0.30 Mo. 125-1.75 Ni.	1.05	3.70
5100 0.60-0.90 Cr.	0.35	3.00
5100 0.80-1.10 Cr.	0.45	3.10
5100 Chrome Spring	0.20	2.85
6100 Bars	1.20	3.85
6100 Spring Steel	0.95	3.60
Chrome Nickel Vanadium	1.50	4.15
Carbon Vanadium	0.95	3.60
9250 (flats)	0.25	2.90
9250 (rounds, squares)	0.50	3.15

Hot rolled alloy billets 4 x 4-inch and over take same prices per gross ton as same specification alloys bars per net ton. Sizes under 4 x 4 to 2½ in. x 2½ in. inclusive sold on bar basis plus steel bar card extras for size. Sizes under 2½ in. x 2½ in. take bar price on net ton basis.

COLD FINISHED STEEL

Bars, drawn or rolled, Pitts., Chi., Buffalo, and Cleve. c.l.	2.10c
Do, delivered, Detroit	2.335c
Shafting (turned, polished) Pittsburgh, Buffalo	2.10c
Shafting (turned, ground) mill	2.45c to 2.90c

(Depending on size, 1 3/16 to 7-inch)

WIRE PRODUCTS

F.o.b. Pittsburgh, Cleveland base

(Per 100 pound keg)

(To Merchant Trade)

Standard wire nails	$2.30 to 2.40
Cement coated nails	2.30 to 2.40
Galvanized nails	4.30 to 4.40

(Per pound)

Polished staples	2.75c to 2.85c
Galvanized staples	3.00c to 3.10c
Barbed wire, galvanized	2.95c to 3.05c
Annealed fence wire	2.45c to 2.55c
Galvanized wire	2.90c to 3.00c

Anderson, Ind., $1 higher. Chicago $2 higher, Duluth, Birmingham $3 higher.

Woven wire fencing, retailers, Pittsburgh-Cleveland, net ton $65.

(To Manufacturing Trade)

Bright plain wire, 6 to 9 gage	2.40c
Spring wire	3.40c
Wire, delivered Detroit	2.535c
Nails, delivered Detroit	$2.535

Joliet, DeKalb and Waukegan, Ill., Anderson, Ind., and Chicago prices $1 per ton over Pittsburgh-Cleveland base on products made there; Duluth $2 higher; Fairfield, Ala., $3 higher.

CUT NAILS, CHAIN, PILING

Cut nails, c.l., f.o.b. mills	2.55c
Cut nails, l.c.l., f.o.b. mills	2.65c
Sheet piling, base, Pittsburgh	2.10c to 2.20c

Chain proof BB and BBB, Pitts.

3/16-in. to ½-in.	33 1/3 and 5 off
9/16-in to 1¼-in.	33 1/3 off

CAST IRON WATER PIPE

Class B Pipe—Per Net Ton

Six-inch and over, Birming'm	$37.00 to 38.00
Four-inch, Birmingham	41.00 to 42.00
Four-inch, Chicago	49.20 to 50.20
Six-inch to 24-inch, Chicago	45.20 to 46.20
Six-inch and over, New York	38.50 to 40.50
Four-inch, New York	41.50 to 42.50
Standard fittings, Bir. base	$100.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $4 higher than Class B.

TIN PLATE; TERNE PLATE

Prices per 100-pound box Pittsburgh

*Tin plate, coke base	$5.25

Gary, Ind., base 10 cents higher.

Long ternes, primes, No. 24	3.90c

*Price subject to quantity differentials.

WASHERS

Wrought, c.l., Pitts. dist.	$6.50 to 6.75 off
Wrought, l.c.l., Chicago dist.	$6.80 to 6.90 off
Wrought, c.l., Chicago	$7.00 to 7.10 off

RAILS, TRACK MATERIAL

Standard bessemer rails, mill	$43.00
Standard open-h'th rails, mill	$43.00
Relay rails, Pitts., 60 to 90 lb.	$25.00 to 29.00
Light rails, 25 to 45, mills	$36.00
Angle bars, Chicago base	2.75c
Spikes, railroad, mills	2.80c
Spikes, small railroad, 7/16-inch and smaller, Pitts.	2.80c
Spikes, boat and barge, Pitts.	3.00c
Spikes, railroad, Chicago	2.80c
Track bolts, Pitts., steam roads	3.80c
Track bolts, Pitts., stand. jobbers	70 off list
Track bolts, Chicago	3.80c
Tie plates, mills	$41.50

BOLTS AND NUTS

Pittsburgh, Cleveland, Birmingham and Chicago

Discounts are for legitimate jobbing or large consuming trade purchasing in full-case lists, apply to lists of April 1, 1927.

Small lots are 55 to 60 per cent off.

CARRIAGE BOLTS

All sizes, cut thread	60 to 70 off

Rolled thread ⅜ x 6 and smaller take 10 per cent lower list.

Eagle list	60 to 70 off

MACHINE BOLTS

All sizes, cut thread	60 to 70 off

Rolled thread ¾ x 6 and smaller take 10 per cent lower list.

Lag screws	60 to 70 off
Plow bolts, Nos. 1-2-3-7 heads	60 to 70 off
Tap bolts	60 to 70 off
Blank bolts	60 to 70 off
Stud bolts without nuts	60 to 70 off

Stove bolts, 75, 20, 10 and 5 off in pkgs., 75, 20, 10 and 5 with 2½ off in bulk.

Tire bolts	60-5 off

Nuts

Semifinished	60 to 70 off

HEXAGON CAP SCREWS

Milled	80-10-5 off
Upset 1 in. diam. and smaller	85 off

SQUARE HEAD SET SCREWS

Milled	80-5 off
Upset 1 in. diam. and smaller	80-10-5 off

RIVETS

Struc., c.l., Pitts.-Cleve.	3.10c
Structural, c.l., Chicago	3.20c
**7/16-inch and smaller, Pitts.	70 and 10 off
Chi., Cleve.	70 to 70 and 10 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Raw Materials and Semifinished Products

SEMIFINISHED STEEL

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$33.00
Pittsburgh, bessemer	33.00
Youngstown	33.00
Cleveland	33.00
Philadelphia	33.30
Chicago	35.00
Forging, Chicago	40.00
Forging, Pittsburgh	38.00
Forging, Philadelphia	43.30

SHEET BARS

Pittsburgh	$33.00
Youngstown	33.00
Cleveland	35.00
Chicago	35.00

SLABS

Pitts., Young.	$33.00
Cleveland	33.00

WIRE RODS

Pittsburgh, Cleveland	$38.00
Chicago	39.00

SKELP

All grades, Pittsburgh	1.80c to 1.85c

IRON ORE

LAKE SUPERIOR ORE

Per Gross Ton, Lower Lake Ports

Old range bessemer, 51½%	$4.80
Mesabi bessemer, 51½%	4.65
Old range nonbessemer, 51½%	4.65
Mesabi nonbessemer, 51½%	4.50
High phosphorus, 51½%	4.40

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63% (contract)	10.00
Copper-free low phos. 58-65%	nominal

FOREIGN ORE

Cents per units, alongside docks Atlantic ports

Foreign manganiferous ore, 45-55% iron, 6-10% manganese	11.00 to 11.50
North African low phosphorus	11.50 to 12.00
Swedish basic, 65%	9.50 to 10.50
Swedish low phosphorus	11.50 to 12.00
Spanish and North African basic, 50 to 60%	10.00 to 11.00
Newfoundland foundry, 55%	9.00
Tungsten future, short ton unit, duty paid	14.50
Chrome ore, 48%, net ton c.i.f.	$22.50

MANGANESE ORE

Prices, not including duty, are cents per unit; cargo lots.

Caucasian (52-55 per cent)	30 cents
Indian (48-50 per cent)	30 cents
Brazilian (46-48 per cent)	28 cents

FLUORSPAR

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton	$18.00
Washed gravel, import duty paid east, tide., gross ton	$19.50 to 20.50

REFRACTORIES

FIRE CLAY BRICK

Per 1000 f.o.b. works

First Quality

Pennsylvania	$43.00
Ohio	43.00
Illinois	43.00
Kentucky	43.00
Missouri	43.00
Maryland	43.00
Georgia and Alabama	40.00 to 47.00

Second Quality

Pennsylvania	35.00 to 38.00
Ohio	35.00 to 38.00
Illinois	35.00 to 38.00
Kentucky	35.00 to 38.00
Missouri	35.00 to 38.00
Maryland	35.00 to 38.00
Georgia and Alabama	30.00 to 35.00

SILICA BRICK

Pennsylvania	48.00
Joliet, Ill., East Chicago, Ind.	52.00
Birmingham	50.00 to 51.00

MAGNESITE BRICK

Per Net Ton

9 x 4½ x 2½	65.00

MAGNESITE

Net Ton Chester, Pa., and Baltimore base

Dead-burned grain magnesite	$40.00
Domes., Chewelah, Wash., base	22.00

CHROME BRICK

Net Ton Chester, Pa., and Baltimore base

9 x 4½ x 2½	$45.00

Pig Iron

Sales Diminishing as Shipments Continue to Improve—Production in Alabama Reaching High Point—St. Louis Market Active

CURRENT sales of pig iron are diminishing while shipments on contracts show moderate expansion. Thus far in April the daily average rate is higher than that in the comparable period of March. Some of the lake furnaces shipped more in March than in any month since last November. The volume of shipments in April is likely to exceed that of March, as foundries report a slightly better operating rate. The automotive industry continues to increase its shipping orders. Production in Alabama this month is at a higher rate than in any period in the past ten years, excepting March, 1927, and December, 1926. Orders exceed output. The week's sales by furnace interests at Cleveland dropped to 21,000 tons. Sales at St. Louis totaled 23,000 tons.

PITTSBURGH, April 8.—Shipments and new buying of pig iron hold to their former restricted rates. Orders still are limited to small tonnages. Melters are holding stock to a low level, necessitating prompt shipment on new business. The movement on old orders is barely ahead of production, despite the fact only four of seven valley merchant stacks are in blast. The Davison Coke & Iron Co. blew out its Sharpsville furnace last week. Inquiry continues dull, with no large tonnages pending. New business generally is closed quietly with regular sources of supply. Prices are holding to their former levels, although tonnage sales of basic are lacking to afford a test.

Boston, April 8.—Sales of pig iron in the past week increased to 7000 tons. The H. B. Smith Co., Westfield, Mass., purchased 4000 tons, about half of the tonnage from Mystic Iron Works and the remainder from a New York state furnace. It is understood the iron was placed at less than $20 a ton, delivered, a slight concession in price. Other sales were in small lots.

New York, April 8.—Pig iron sales in the past week aggregated close to 10,000 tons in this district, slightly less than in the preceding week. Prices are unchanged, with Buffalo iron holding at $16.50 to $17, base, furnace, subject to occasional shading of 50 cents a ton, and southern iron at $18.50, delivered, New York docks. The American Locomotive Co. opened bids April 7 on 400 tons of foundry iron for Schenectady, N. Y. The A. P. Smith Mfg. Co., Bloomfield, N. J., is inquiring for 600 tons of foundry iron, while another northern New Jersey consumer is inquiring for 600 tons.

Buffalo, April 8.—Purchases of pig iron have continued to decline following the brisk buying in the last half of March. Sales in the past week amounted to only a few thousand tons. Furnaces claim $16.50 is minimum on foundry iron for eastern delivery, and $18.50 for local delivery.

Cleveland, April 8.—Shipments of pig iron on daily average basis so far this month are larger than in March, and March was the best month since last November for some of the leading furnace interests here. The total for the current month will be above that for March, shipping instructions indicate. An increase again is reported in the volume of shipments to automotive foundries, while manufacturers of road machinery are steadily expanding requirements. Sales booked by furnace interests with headquarters here dropped to 21,000 tons in the past week, from 25,000 tons in the preceding week. Current business is limited mainly to small lots. A Canton, O., melter placed 1000 tons. The local market is quiet, sales by Cleveland furnaces making up only a small proportion of the total. For local delivery the price continues $19, base, furnace, and for outside competitive points, $18 to $18.50. Lake furnaces quote $19 to $19.50, base for shipment in northern Indiana and lower Michigan.

Youngstown, O., April 8.—The number of valley merchant furnaces producing foundry and basic pig iron will be reduced further if plans mature whereby one stack will produce low phosphorus iron. Decision may be made public within a few days. Sales continue to be made here at $19, valley, for malleable and $18.50 for No. 2 foundry.

Cincinnati, April 8.—Sales of 4300 tons of pig iron in the past week include 1000 tons for a central Ohio consumer and 300 tons for a Cincinnati firm. Prices are unchanged. Inquiries for 500 tons of northern iron for a central Ohio consumer and 600 tons of silvery for Michigan are current.

St. Louis, April 8.—About 23,000 tons of pig iron was sold in the past week in this district, the largest amount since buying was under way for the first quarter. This included 15,000 tons of basic, purchased by an east-side melter from the St. Louis Gas & Coke Corp. The St. Louis producer also booked 5000 tons for foundry and malleable iron for other melters. The remainder of the tonnage is southern and northern iron. Demand for malleable is larger and comes mainly from foundries on automotive work. Prices are steady.

Toronto, April 8.—More than 60 per cent of the melters who place contracts have covered requirements to the end of June. Some improvement is noted in demand for iron for prompt delivery. Inquiries are coming out for delivery when navigation begins on the Great Lakes. Prices are unchanged.

Birmingham, Ala., April 8.—Demand for pig iron is stronger. Pro-

(*Concluded on Page* 102)

Pig Iron Prices

Per Gross Ton

Bessemer, valley furnace	$19.00
Bessemer, del. Pittsburgh	20.76
Basic, valley furnace	18.50
Basic, Pitts. dist. fur.	19.00
*Basic, del. Pitts.	19.63 to 20.13
Basic, del. eastern Pa.	18.76 to 19.25
Basic, Buff. fur. for local del.	18.00
Malleable, valley furnace	19.00
Malleable, Pitts. dist. fur.	19.50
*Malleable, del. Pittsburgh	20.13 to 20.63
Malleable, Cleve. fur. for local del.	19.00
Malleable, Chicago furnace	19.50
Malleable, Buff. fur. for local del.	19.00
Malleable, del. eastern Pa.	20.26 to 22.40
Malleable, Granite City fur.	19.50
No. 1 foundry, Chicago furnace	20.00
No. 1X, Eastern, del. Phila.	21.26 to 21.76
No. 1X, Buff.. fur. for local del.	20.00
No. 2 foundry, valley furnace	18.50
No. 2 fdy., Pitts. dist. fur.	19.00
*No. 2 foundry, del. Pittsburgh	19.63 to 20.13
No. 2 plain, Buff. fur. for local del.	18.50
No. 2 foundry, Chicago furnace	19.50
No. 2 fdy., Cleve. fur. for local del.	19.00
No. 2 fdy., Granite City	20.00
No. 2 plain, del. Phila.	20.26 to 20.76
No. 2 plain, Virginia furnace	17.75
No. 2 plain, Buffalo, del. Boston	21.41 to 21.91
No. 2 Brooklyn, Buffalo, all rail	21.41 to 21.91
No. 2, Newark, Buffalo, all rail	19.78 to 20.28
No. 2 Ala., Bir. base, local del.	14.00
No. 2 Tenn., Bir. base, local del.	15.00
No. 2 Tenn., del. Cincinnati	16.69 to 18.19
No. 2 Alabama, del. Cincinnati	16.69 to 18.19
No. 2, Alabama, del. Cleveland	19.51 to 20.51
No. 2, Alabama, del. Chicago	18.20 to 19.01
No. 2 Alabama, Del., St. Louis	18.42 to 18.92
No. 2 Ala., Phila., dock dely.	18.25 to 19.25
No. 2 Ala., Balt., dock dely.	18.00 to 19.00
No. 2 Ala., N. Y., dock dely.	18.50
No. 2 Ala., Boston, dock dely.	20.21
No. 2X, Brooklyn, Buffalo all rail	21.91 to 22.41
No. 2X, Newark, Buff. all rail	20.28 to 20.78
No. 2X, eastern, del. Phila.	20.76 to 21.26
No. 2X, Buffalo, fur. for loc. del.	19.00
No. 2X, Buffalo, del. Boston	21.91 to 22.41
No. 2X, Virginia furnace	18.25
Gray forge, Pitts. dist. fur.	18.50
*Gray forge, del. Pittsburgh	19.13 to 19.63
Low phos., standard, valley	27.00
Low phos., standard, Phila.	24.76
Low phos., copper bearing fur.	23.00 to 23.50
Charcoal, Superior, del., Chicago	27.04

*Freight from Pittsburgh district furnace to points in Pittsburgh district 63.00c, 76.00c and $1.13 per ton.

CANADIAN PRICES

No. 1 foundry, del. Toronto	$22.60
No. 1 foundry, del. Montreal	24.00
No. 2 foundry, del. Toronto	22.10
No. 2 foundry, del. Montreal	23.50
Malleable, del. Toronto	22.60
Malleable, del. Montreal	24.00
Basic, del. Montreal	22.50

Silvery iron, Jackson county, O., furnace in per cents: 5—$22; 6—$22 to $23; 7—$23 to $24; 8—$24 to $25; 9—$25 to $26; 10—$27 to $28; 11—$29 to $30; 12—$31 to $32; 13—$33 to $34.

Bessemer ferrosilicon, Jackson county, O., furnaces, in per cents: 10—$30; 11—$32; 12—$34; 13—$36; 14—$38; 15—$41; 16—$43.50; 17—$46.50.

Coke

Further Increase Reported in Connellsville Output—Market Exhibits an Easier Tone

WITH demand for heating coke considerably reduced, the market for metallurgical grades appears easier, though quotations are unchanged. Production in the Connellsville district has been further increased to a rate above 31,000 tons weekly, compared with a rate of approximately 73,000 tons a year ago. Contracting for second quarter is nearly complete.

Pittsburgh, April 8.—Demand for beehive coke is quiet, giving the market an easy tone, although the price of the furnace grade for spot shipment is unchanged at $2.60. No improvement is noted in spot orders or shipments on contracts. Production is slightly heavier, but adjusted to requirements. New contracting is nearly complete. Furnace coke sales and shipments are steady but lack briskness. The market for heating coke is quiet.

Production of coke in the Connellsville region for the week ended March 29 was 31,320 tons compared with 29,110 tons the preceding week and 73,860 tons in the same period a year ago, according to the *Connellsville Courier*.

Boston, April 8.—Foundries continue their policy of limiting purchases of coke to immediate requirements. Prices are firm.

New York, April 8.—Standard grades of beehive furnace coke continue $2.60 to $2.75, Connellsville, with demand showing little improvement. Beehive foundry coke is unchanged at $3.50 to $3.75, Connellsville, and $4.85, Latrobe. By-product coke is holding at $9 to $9.40, delivered Newark; $11, New England; and $9, Philadelphia.

St. Louis, April 8.—Moderate improvement is noted in demand for coke. Stove and jobbing foundries have increased consumption. Supplies are abundant and transportation prompt, so there is little incentive to buy ahead. Prices are steady.

Birmingham, Ala., April 8.—Orders for coke continue to be received from other districts, while consumption in Alabama is unchanged, and production is at a steady rate. Surplus at ovens is small. By-product foundry coke is steady at $5, base Birmingham.

Cincinnati, April 8.—By-product foundry coke is moving slowly. Some contracts expiring April 1 were closed quietly at former prices.

Coke Prices

Prices Per Net Ton

Beehive Ovens

Connellsville furnace	$2.60
Connellsville foundry	3.50 to 4.85
New River foundry	6.00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25

By-Product Foundry

Newark, N. J., del.	$9.00 to 9.40
Chicago ovens	8.00
New England, del.	11.00
St. Louis, del.	9.00
Birmingham, ovens	5.00
Indianapolis del.	8.25
Ashland, Ky., ov., Connell. basis	6.50
Portsmouth, O., ov., Connell. basis	6.50
Buffalo ovens	8.75
Detroit ovens	9.00
Philadelphia, del.	9.00

Ferroalloys

Specifications Continue at March Rate —Prices Steady

New York, April 8.—Ferromanganese specifications are maintained at the March rate, which was fairly good, as indicated by ingot production at 84.12 per cent for that month. Prices are unchanged at $99, duty paid, tidewater, to users of carloads to 500 tons annually, with differentials on larger quantities. Domestic spiegeleisen, 19 to 21 per cent, also is steady at $34, furnace, in carload lots, differentials applying to larger quantities. With the exception of tungsten, prices of special alloys are unchanged from those ruling since early in the year. Future tungsten ore can be had at $14.50 a short ton unit, basis of the new duty, or perhaps less, while spot is near $15. Domestic ore remains about $2 higher. All prices are nominal.

Pittsburgh, April 8.—Ferroalloys continue in steady demand although shipments are under the peak rate attained during February. Prices continue $103.79, delivered, for small lots of ferromanganese and $34 for spiegeleisen. Ferrotungsten is dull, with the price generally $1.40. Ferrochrome remains active, while specifications for ferrovanadium are smaller than a year ago. Prices on other grades are unchanged.

Chicago, April 8.—Foreign spiegeleisen, 25 to 28 per cent, is being offered here at prices figuring below $40 for the base grades. A shipment is expected early in the navigation season. Less than carload sales of ferromanganese, ferrosilicon and ferrochrome are in moderate volume.

Los Angeles Sees Future in Iron and Steel

Los Angeles claims to be heading "for a position among the foremost iron and steel centers of the globe." Taking into account all metalworking industries, the Los Angeles chamber of commerce claims that in 1929 the value of production within the city's boundaries was $79,573,438, the number of establishments 388, the number of wage earners 13,494, and their wages $20,329,952.

The chamber of commerce claims that southern California iron ores are sufficiently richer than those of Alabama or Minnesota to offset any slight excess cost of hauling western coke and coal from Utah. It is claimed that southern California iron ore assays as high as 63 per cent metallic iron. The unit cost of California local ores is said to be $0.0435 compared with $0.1099 for Mesabi ore.

Bolts, Nuts, Rivets

Demand Increases but is Below Seasonal Level

NUT AND BOLT PRICES, PAGE 92

Pittsburgh, April 8.—Specifications for bolts, nuts and rivets hold at a slightly better rate than a month ago although business still is below the usual seasonal volume. Second quarter contracting is completed, with the market steady at 60 to 70 off for bolts and nuts and 3.10c, Pittsburgh, for large rivets. Operations are slightly higher at 60 to 65 per cent.

Cleveland, April 8.—Miscellaneous buying of bolts and nuts keeps up in fair volume. Jobbers order only as needed. Operations are about 60 or 65 per cent. A fair number of small rivet orders are received from fabricating, locomotive building and other shops.

Chicago, April 8.—Specifications for bolts, nuts and rivets remain at 5 to 10 per cent under last year. Second quarter contracting has been completed at first quarter quotations, based on 60 to 70 off for bolts and nuts.

Ferroalloy Prices

(In dollars, except Ferrochrome)

*Ferromanganese, 78 to 82 per cent tidewater, duty paid	$99.00
*Ferromanganese del. Pittsburgh	103.79
Spiegeleisen, 19 to 21 per cent, domestic furnace spot†	34.00
*Ferrosilicon, 50 per cent, freight allowed, carloads	83.50
*Do, less carload	88.50
Do, 75 per cent	13.00 to 15.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. per lb., con., del.	11.00
Do, for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	1.40 to 1.45
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload producers' plants, net ton	160.00
Do, one ton to carload	170.00
Ferrophosphorus, per ton, carload 17 to 19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic, per ton carload, 23-25% f.o.b. Anniston, Ala. (24 per cent)	122.50

†Carloads. Differentials apply to large quantities.

*To users of carloads to 500 tons annually. Differentials apply to users of larger quantities.

Scrap

Quiet Continues and Prices Show Further Decline—Supply Is Not Heavy Burden on Market

DOWNWARD tendency in most grades of scrap continues but melters are taking fairly large tonnages and no oversupply is apparent. Lower prices have checked collecting outside large centers. Borings now are quoted in two grades at Chicago. Most dealers have fairly good orders on books.

Chicago, April 8.—Specialty grades of iron and steel scrap are easier, while basic material has been holding its own. Shipments from outside collection points are in moderate volume, and it is clearly indicated that no marked over-supply of prepared scrap exists. Most dealers have good order books from recent tonnage purchases of heavy melting steel and other open-hearth grades. Rolling mill scrap orders also have been steady. Shipments of steelworks show no declines from the past two months. Quotations have dropped 50 to 75 cents on some specialties. A large consumer of cast borings is refusing to take shipments from dealers' yards, which has led to setting up two distinct borings grades, known as factory and dealer borings. The price range now is $9.25 to $9.75 in view of the recent sale to a large consumer under $10. Heavy melting steel is at $13 to $13.50. Some fears are expressed that the recent easier market may have developed a shrinkage of classified scrap from outlying territory. Melting steel on the Chicago & North Western list sold at $12, net, but this apparently was due to high bid-

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons delivered to consumers, except where otherwise stated.

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	10.50 to 13.00
Boston, dealers	9.50 to 10.25
Buffalo, No. 1	14.00 to 14.75
Buffalo, No. 2	12.00 to 12.25
Chicago	13.00 to 13.50
Cincinnati, deal	11.50 to 12.00
Cleveland, No. 1	13.25 to 13.75
Cleveland, No. 2	12.50 to 13.00
Detroit, No. 1 deal.	11.75 to 12.25
Detroit, No. 2 deal.	10.00 to 10.50
East Pa., del. mill	14.00 to 14.50
N. Y. deal R. R.	10.50
N. Y., deal. yd.	8.00 to 8.50
Pittsburgh No. 1	15.75 to 16.25
St. Louis, No. 1 sel.	13.00 to 13.25
Federal, Ill.	12.50 to 12.75
Granite City, Ill.	11.50 to 12.00
Valleys, No. 1	16.00 to 16.50

COMPRESSED SHEETS

Buffalo (dealers)	12.00 to 12.25
Chicago	12.00 to 12.50
Cleveland	12.25 to 12.75
Detroit, dealers	11.25 to 11.75
E. Pa. new mat.	13.00 to 13.50
Pittsburgh	15.50 to 16.00
Valleys	15.50 to 16.00

BUNDLED SHEETS

Buffalo	9.50 to 10.00
Cincinnati, deal.	10.25 to 10.75
Cleveland	10.50 to 11.00
Eastern Pa.	11.50 to 12.00
Pittsburgh	14.00 to 14.50
St. Louis	9.00 to 9.50

SHEET CLIPPINGS LOOSE

Chicago	7.50 to 8.00
Cincinnati	8.00 to 8.50
Detroit, dealers	8.50 to 9.00
St. Louis	9.00 to 9.50

STEEL RAILS SHORT

Birmingham	11.00 to 12.00
Boston, dealers	8.50 to 10.00
Buffalo	17.50 to 18.00
Chicago (3 feet)	16.50 to 17.00
Chicago (2 feet)	17.00 to 17.50
Cincinnati, deal.	17.75 to 18.25
Detroit, dealers	15.50 to 16.00
Pittsburgh, (open-hearth, 3 ft. and less)	20.00 to 20.50
St. Louis	17.00 to 17.50

STOVE PLATE

Birmingham	10.00 to 11.00
Boston, consumers	10.50 to 11.00
Buffalo	11.75 to 12.00
Chicago, net	10.00 to 10.50
Cinn., deal. net	8.50 to 9.00
Detroit, net, deal.	9.00 to 9.50
Eastern Pa.	10.50 to 11.00
N. Y., deal., mill	7.75 to 8.25
St. Louis	11.00 to 11.50

COUPLERS, SPRINGS

Buffalo	18.25 to 18.75
Chicago	15.50 to 16.00
Eastern Pa.	19.50 to 20.50
Pittsburgh	20.00 to 20.50
St. Louis	14.00 to 14.50

ANGLE BARS—STEEL

Chicago	15.00 to 15.50
St. Louis	12.50 to 13.00

LOW PHOSPHORUS

Buffalo, billets and bloom crops	18.50 to 19.00
Cleve. billet and bloom crops	17.00 to 17.50
Eastern Pa.	20.00 to 21.00
Pitts. billet and bloom crops	21.50 to 22.00
Pitts. Sheet bar crops	20.50 to 21.00

FROGS, SWITCHES, GUARDS

Chicago	14.00 to 14.50
St. Louis	13.50 to 13.75

SHOVELING STEEL

Chicago	13.00 to 13.50
Cleveland	11.00 to 11.50
St. Louis	12.00 to 12.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	10.00 to 11.00
Boston, dealers	10.00 to 10.50
Buffalo, No. 1	11.50 to 12.00
Buffalo, No. 2	14.00 to 14.50
Chicago, No. 1	13.50 to 14.00
Chicago, No. 2	13.00 to 13.50
Cincinnati, No. 2	11.50 to 12.00
Eastern Pa.	15.50 to 16.00
N. Y., No. 1 deal.	11.75 to 12.00
Pittsburgh, No. 2	15.75 to 16.25
St. Louis, No. 1	11.25 to 11.75
St. Louis, No. 2	12.50 to 12.75

SPECIFICATION PIPE

Boston	8.50 to 9.00
Eastern Pa.	13.50 to 14.00
New York, deal.	9.25 to 9.75

BUSHELING

Buffalo, No. 1	12.25 to 12.75
Chicago, No. 1	11.00 to 11.50
Cinn., No. 1 deal.	10.00 to 10.50
Cinn., No. 2	6.50 to 7.00
Cleveland, No. 2	9.50 to 10.00
Detroit, No. 1 new deal.	10.50 to 11.00
St. Louis, No. 1	9.50 to 10.00
Valleys, new No. 1	15.00 to 15.50

MACHINE SHOP TURNINGS

Birmingham	7.00 to 8.00
Boston, dealers	5.60 to 6.10
Buffalo	9.00 to 9.50
Chicago	7.50 to 8.00
Cincinnati, deal.	7.75 to 8.25
Cleveland	8.50 to 9.00
Detroit	7.25 to 7.75
Eastern Pa.	10.50 to 11.00
New York, deal.	7.00
Pittsburgh	11.00 to 11.50
St. Louis	6.75 to 7.25
Valleys	11.25 to 11.75

MIXED BORINGS, TURNINGS

For blast furnace use

Boston, dealers	5.25 to 5.60
Buffalo	11.00 to 11.25
Cincinnati, deal.	8.50 to 9.00
Cleveland	9.75 to 10.25
Detroit, dealers	8.00 to 8.25
Eastern Pa.	10.50 to 11.00
New York, deal.	6.50
Pittsburgh	11.00 to 11.50

CAST IRON BORINGS

Birmingham, chem.	12.00 to 13.00
Birmingham, plain	7.00 to 8.00
Boston, chem.	8.50 to 9.00
Boston, dealers	5.50 to 6.00
Buffalo	11.00 to 11.25
Chicago	9.25 to 9.75
Cincinnati, deal	8.25 to 8.75
Cleveland	9.75 to 10.25
Detroit, dealers	8.00 to 8.25
Eastern Pa.	11.00
Eastern Pa., chem.	14.00
New York, deal.	6.50 to 7.00
Pittsburgh	11.00 to 11.50
St. Louis	9.50 to 9.75

PIPE AND FLUES

Cincinnati, deal.	9.00 to 9.50

RAILROAD GRATE BARS

Buffalo	11.00 to 11.50
Chicago, net	10.75 to 11.25
Cincinnati,	9.00 to 9.50
Eastern Pa.	11.50 to 12.00
New York, deal.	7.75
St. Louis	11.50 to 12.00

FORGE FLASHINGS

Boston, dealers	8.50 to 9.00
Buffalo	12.50 to 12.75
Cleve. over 10 in.	11.25 to 11.75
Detroit	10.50 to 10.75

FORGE SCRAP

Boston, dealers	8.00 to 8.50
Chicago	17.00 to 17.50
Eastern Pa.	13.50

ARCH BARS AND TRANSOMS

Chicago, net	16.75 to 17.25
St. Louis	19.50 to 20.00

Iron, Steel Works Scrap

AXLE TURNINGS

Boston, deal.	6.75 to 7.00
Buffalo	13.50 to 14.00
Chicago steelworks	10.50 to 11.00
Cleveland	12.00 to 12.50
Eastern Pa.	13.50
Pittsburgh	14.00 to 14.50
St. Louis	10.00 to 10.50

STEEL CAR AXLES

Birmingham	14.00 to 15.00
Boston, ship point	15.50 to 16.50
Buffalo	17.50 to 18.00
Chicago	17.90 to 18.50
Eastern Pa.	21.00 to 22.00
Pittsburgh	20.50 to 21.00
St. Louis	19.00 to 19.50

SHAFTING

Boston, ship point	13.60 to 14.50
Chicago	16.25 to 16.80
Eastern Pa.	19.00
New York, deal.	14.00 to 14.50
St. Louis	18.00 to 18.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	10.00 to 11.00
Boston, iron	14.00 to 14.50
Buffalo, iron	13.25 to 13.75
Buffalo, steel	18.00 to 18.50
Chicago, iron	14.50 to 15.00
Chi., rolled steel	17.00 to 17.50
Cincinnati	12.00 to 12.50
N. Y., iron, deal.	10.50 to 11.00
Pittsburgh iron	15.00 to 15.50
Pittsburgh, steel	20.00 to 20.50
St. Louis, iron	13.75 to 14.25
St. Louis, steel	16.00 to 16.50
East Pa. steel	19.50 to 20.50
East Pa. iron	15.00

NO. 1 CAST SCRAP

Birmingham, cup.	10.00 to 11.00
Buffalo	13.25 to 13.75
Boston, textile	12.75 to 13.50
Chicago, mach.	15.70 to 16.25
Chicago, railroad	14.60 to 15.10
Chicago, agri.	13.15 to 13.70
Cincinnati, mach. cupolas, gross	18.25 to 18.75
Cleveland, cupola	14.50 to 15.00
Detroit, net deal.	10.50 to 11.00
East Pa. cupola	15.50
N. Y. cup. deal.	10.85
N. Y., del. local foundries	15.00
Pittsburgh, cupola	15.00 to 16.00
San Fran., del.	13.50 to 14.00
Seattle	14.50 to 14.75
St. L. No. 1 mach.	14.50 to 15.00
St. Louis, No. 1	13.50 to 14.00

HEAVY CAST

Boston	10.50 to 11.00
Boston, mach. cast.	14.50 to 15.25
Buffalo, breakable	10.00 to 10.50
Cleve., breakable	10.50 to 11.00
Detroit, auto, net Dealers	12.00 to 12.50
Detroit, break. deal	8.00 to 8.50
Eastern Pa.	14.00
New York, deal.	9.75 to 10.50
Pittsburgh	11.50 to 12.00

MALLEABLE

Boston, railroad	16.50 to 17.00
Buffalo	17.00 to 17.50
Chicago, agri.	14.75 to 15.25
Chicago, railroad	16.50 to 17.00
Cinn., R. R. deal.	15.25 to 15.75
Cinn., agri., deal.	14.25 to 14.75
Cleveland, rail	17.00 to 17.50
Detroit, auto deal.	14.00 to 14.50
St. Louis, rail	14.50 to 15.00

Miscellaneous Scrap

RAILS FOR ROLLING

5 feet and over

Birmingham	13.00 to 14.00
Boston	10.75 to 11.00
Buffalo	14.00 to 14.50
Chicago	15.00 to 15.50
Eastern Pa.	15.50 to 16.00
New York	10.50 to 11.00
St. Louis	14.00 to 14.50

LOCOMOTIVE TIRES

Chicago, cut	16.50 to 17.00
St. Louis No. 1	13.75 to 14.25

LOW PHOS. PUNCHINGS

Chicago	14.50 to 15.00
Pittsburgh	18.50 to 19.50
Eastern Pa.	19.00

ding by interests seeking to prevent competitive control of cheaper scrap.

Boston, April 8.—Scrap conditions are dull. Prices are easier and the only favorable factor is some buying for export. This week a steamer will sail with a fair consignment for Japan and a second tonnage is scheduled for that country later on. Buying is also appearing for an export shipment to Danzig, to leave in about a fortnight.

New York, April 8.—Consuming demand for scrap continues dull, with dealers' buying prices soft, and a revision in grate bars, which are now holding at $7.75, New York, compared with a spread of $7.75 to $8.25. Owing to extreme dullness prices on some grades are purely nominal. This appears to be particularly true in No. 1 heavy and No. 1 machinery cast.

Philadelphia, April 8.—Firmer tone of a week ago has not been retained by the iron and steel scrap market and stove plate, borings and turnings have sold at 50 cents less. Heavy melting steel has sold at $14, delivered in this district. The tonnage involved is small.

Buffalo, April 8.—There is no major demand for any grade of scrap. Distress tonnage has been sold about 50 cents under recent low quotations. Stove plate, No. 1 cast and blast furnace scrap are among materials revised downward. Specialties are weaker. Old contracts are the sole basis of most prices now quoted by dealers.

Pittsburgh, April 8.—Scrap is easy, with prices on most grades nominal because of lack of mill buying. Heavy melting steel is off 25 cents on the basis of prices of $16.15 to $16.25 paid for this grade on the Pennsylvania railroad list. With limited offerings, dealers claim they are not interested in orders at less than $16.50. Heavy cast is more active but easier and blast furnace grades are dull.

Cleveland, April 8.—Iron and steel scrap continues dull. Mills have placed no orders of size in several weeks. Shipments continue at the reduced rate of last week. Prices are holding fairly steady but in most cases are nominal. No. 1 heavy melting steel brings $13.25 to $13.75, while No. 2 averages 75 cents a ton lower. Compressed sheets are slightly easier at $12.25 to $12.75.

Detroit, April 8.—Iron and steel scrap has shown further weakness but most dealers believe that present levels represent close to the bottom for this movement. Declines are recorded this week in short shoveling turnings, malleable, forge flashings and borings. Offerings of scrap by automobile manufacturers show a slight increase. Moderate sales have been made in the Pittsburgh district, but demand from Youngstown continues at an extremely low ebb. Little is yet heard concerning water shipments of scrap this season.

Cincinnati, April 8.—Iron and steel scrap showed no improvement the past week, with demand low and buyers hesitant except at distress prices. Cast iron borings lost another 25 cents for a quotation of $8.25 to $8.75.

Birmingham, Ala., April 8.—No improvement is reported in the iron and steel scrap market. Heavy melting steel users apparently have good sized stock on hand. Prices range from $10.50 to $13.

St. Louis, April 8.—Purchasing of iron and steel scrap is spotty, but in sufficient volume to hold the market steady at the lower levels reached in March. Dealers have not changed quotations and in some quarters the belief prevails that the bottom has been reached. The market has had a fair test, as offerings have been in liberal volume. Scrap has been well absorbed, no distress material being in evidence and melters for the most part accepting due quotas.

Toronto, Ont., April 8.—Little change has appeared in the iron and steel scrap market. Mills are withholding orders and steel scrap is sluggish.

Canadian Scrap

Dealers Buying Prices

MONTREAL
Per Gross Ton

Iron axles	$19.00
Steel axles	17.00
Car wheels	14.50
Stove plate	12.00
Wrought pipe	6.00
Turnings	6.50
Heavy melting steel	8.00

TORONTO

Steel axles	14.00
Iron axles	16.00
Heavy melting steel	9.00
Turnings	7.00
No. 1 mach. cast (net)	15.00
Malleable (net)	11.50

Semifinished Steel

Moderate Improvement in Specifications—Prices Steady

SEMIFINISHED STEEL PRICES, PAGE 92

Pittsburgh, April 8.—Specifications for semifinished steel are light and only a slight improvement is noted compared with activity a month ago. New business consists mainly of small spot orders. Prices generally are $33 for billets, sheet bars and slabs, with forging billets continuing $38. Wire rods are steady at $38. Skelp is quiet.

Youngstown, O., April 8.—Some sales of sheet bars to independent sheet mills in this district are noted. Shipments are fair, but stripmakers are taking only absolute needs in billets. Wire rod sales are slow. Billets, sheet bars and slabs hold at $33, Pittsburgh and Youngstown.

Cleveland, April 8.—A slight increase in shipments of semifinished steel has led the independent producer here to add another open hearth to its active list, 12 of 14 now operating. Open market sales are light, and prices continue $33, base, Youngstown and Cleveland, for sheet bars, billets and slabs.

Chicago, April 8.—Total contract obligations for semifinished steel for second quarter are about equivalent to last year. Prices are nominal at $35, Chicago, for sheet bars, and commercial or rerolling billets, 4 x 4-inch base. Wire rods are $39, Chicago.

Philadelphia, April 8.—Billet prices remain $33, base, Pittsburgh, for rerollers and $38 for forging quality. Wire rods are $38, base, Pittsburgh.

Operating Rates

Districts Average 77—No Losses Shown—Cleveland Gains

Pittsburgh—Schedules of steelmaking furnaces and finishing mills generally are unchanged this week. Ingot output continues around 75 per cent. Sheet production is unchanged at 75, with tin plate steady at 85. Strip schedules continue 60 per cent, with pipe mills 40.

Youngstown, O.—Improvement is expressed in better mill operations this week. With 35 of 51 open hearths running for the independents, bessemer unchanged at 70, Corporation output at 70, the general average approximates 70 per cent. Better buying is seen in the schedules of flat-rolling departments, with independents operating 95 of their 120 sheet mills, an increase of three over last week. Strip steel production advanced to 80. Independent tin plate production is at capacity and that of the Corporation at about 75. Bar mills will run 70 per cent for the independents, 75 for Corporation. Pipe lags, with output not over 50.

Buffalo—Steelworks operations here maintain the high level of the year established last week. They are on a 77 per cent production scale, with prospect of holding at, or above, that mark for the rest of the month. Most finishing mills are on double turn.

Chicago—Steel ingot rate is unchanged at 90 to 95 per cent. Plate mills are operating at a higher rate, the average for the district being above 90. Structural mills are at about 70 to 75, a few points below the rate earlier in the year. Steelworks blast furnace rate is unchanged, with 26 of the 36 stacks in the district blowing. The leading interest has nine active at Gary, seven at South Chicago, and one at Joliet.

Cleveland—Steelworks production has returned to a 76 per cent rate, the level reached the first of the month and the highest since late February. Twenty-six of the district's 34 open hearths are pouring, with the leading interest virtually at capacity, having 12 of 14 on. The same company has all four blast furnaces on.

Form New Scrap Group

A committee of scrap dealers from California was recently granted a petition to become the thirteenth chapter of the Institute of Scrap Iron and Steel Inc. It is expected that Benjamin Schwartz, director general, will visit the Pacific coast in the near future to survey the scrap iron situation and complete the organization of the chapter.

The Market Section

Bars

Buying Heavier Than Month Ago but Seasonally Light—Pace Steadier in Western Sections

MILLS find demand for steel bars growing steadily and now exceeds March, little below the rate of a year ago. At Chicago deliveries are two to six weeks. Stocks of consumers are low and a small increase in demand would start buying actively for protection. Implement makers have slowed production less than expected in changing seasonal classes of production.

BAR PRICES, PAGE 91

Chicago, April 8.—Sales of finished steel have reached the heaviest volume of this year, but bars and structurals are slower than plates. One producer reports sales of bars, plates and shapes, with little railroad material included, the heaviest since last October. Except automotive buyers, consumers are specifying at a steadier pace and are not far behind a year ago. Slowing down of some implement works for the change into harvesting machinery output has been less marked than was expected. Larger tractor works are close to capacity. While forward buying is slightly heavier, quarterly sales are relatively lighter except when orders for specific work lap over. Merchant bars are expected to be more active later this year, particularly in view of the expansion in automotive and aircraft parts manufacture in the West. Bar deliveries are two to six weeks, according to rolling schedules. The price range for soft steel bars is 1.90c to 2.00c, Chicago. In line with the recent decline in soft steel bars, rail steel bars are down to a base of 1.85c, Chicago Heights, instead of 1.85c to 1.90c. Rail steel bar sales are showing some improvement with Chicago Heights mill operations averaging about 90 per cent.

New York, April 8.—Steel bar specifications are spotty with prices at 1.80c to 1.85c, Pittsburgh. Iron bars are unchanged at 1.75c, Pittsburgh.

Philadelphia, April 8.—Steel bars are now more frequently quoted 1.80c, base, Pittsburgh, although the majority of consumers continue to be named 1.85c. Steel bar demand is about the same as in the first quarter.

Pittsburgh, April 8.—Steel bar specifications showed a slight improvement during the past week and are heavier than a month ago, although aggregate tonnage is seasonally light. This is due principally to restricted demand for automotive use. Consumers' stocks hold at a low level and any improvement in consumption would be reflected quickly in demands upon mills. Backlogs also are light. The market continues 1.80c to 1.85c, Pittsburgh.

Cleveland, April 8.—Demand for soft steel bars has improved moderately, chiefly from automotive users. Indications are that April will develop noteworthy gains over March shipments. Bolt, nut and rivet makers continue to specify at unchanged rates. Soft steel bars are quoted at 1.80c to 1.85c, Cleveland, by local producers, with most outside mills meeting these levels.

Detroit, April 8.—Specifications for soft steel bars have improved mildly, indicating that April receipt will be heavier than those for March. Some buyers are doing 1.80c, Cleveland, on soft steel bars. On small lots some makers have offered 1.80c, Pittsburgh. Alloy steel bars are reported unchanged at 2.65c, mill.

Who's Who Committee Is Chosen by Council

Appointment of a committee to cooperate in the publication of a new edition of *Who's Who in Engineering* has been announced by the American Engineering council. The function of the committee whose 14 members represent membership in the leading American engineering societies, is to provide such advice on the qualifications of engineers as will enable the publishers to issue a work which will be authoritative.

Drawback Is Extended

Washington, April 8.—The allowance of drawback on die blocks manufactured by Heppenstall Forge & Knife Co., Pittsburgh, with the use of imported pig iron has been extended by the treasury department to cover the same manufactured by the Heppenstall Co., its successor.

Plates

Demand Increasing in Middle West—Production at Chicago Near Capacity—Prices Steady

ACTIVITY in the plate market is increasing steadily in the Middle West, with mills in the Chicago district approaching capacity operations. More than 6000 tons of plates were placed for southwestern refinery work. Negotiations indicate an early closing for the Texas-Chicago pipe line, requiring 200,000 to 250,000 tons. Hartford, Conn., closed for 5900 tons of sheet piling.

PLATE PRICES, PAGE 91

Chicago, April 8.—Plate mills are approaching capacity operations. Backlogs have been strengthened by the booking of 6000 to 7000 tons of plates in two lots by local fabricators for refinery work in Texas and Oklahoma. This leaves about 20,000 tons of tank plates on inquiry. It is indicated the negotiations between seven utility, oil and gas companies for the pipe line from the Texas Panhandle to Chicago, which will require 200,000 to 250,000 tons of plates, will lead to an early closing of this project. Chicago district plate mills may get the bulk of this tonnage. Miscellaneous buyers have been finding it difficult to get deliveries in less than three weeks. Mills report slightly more forward buying. The price range is 1.90c to 2.00c, Chicago.

Philadelphia, April 8.—Careful investigation reveals fully 98 to 99 per cent of the plate consumers in this district are paying 1.90c, base, Coatesville, and the report that 1.85c is the market has no foundation in fact. Between 1 and 2 per cent of the buyers, numerically, are obtaining quantity differentials and are paying from 1.70c to 1.85c, base, Coatesville. This preferential class includes certain railroads, shipyards, structural fabricators and jobbers.

New York, April 8.—Plate buying is irregular, with prices easier at 1.85c to 1.90c, Coatesville. Much of the projected ship work is slow in developing and tank and pipe work is lighter. Ten switch engines and five extra tenders placed by the Erie railroad and 70 coaches placed by the Reading will require a total of 800 tons of plates.

Erie, Pa., is taking bids April 29 on 2200 tons of 30 to 72-inch steel pipe and Boston is taking bids, April 17, on 1000 tons of 60-inch pipe. New Orleans is in the market for an unstated tonnage of large size pipe.

Pittsburgh, April 8.—Incoming plate business is steady, little change being noted compared with the activity of the preceding two months. Barge business again is quiet, an inquiry for 30 barges for the Callahan Construction Co., St. Louis, having been withdrawn. Pending work in sheet piling remains fairly large. Recent awards include 5900 tons for Hartford, Conn. The price of sheet piling generally is 2.20c, Pittsburgh, with 2.10c applied on

attractive tonnages. Plates generally are 1.80c, with 1.85c applied on smaller tonnages.

Cleveland, April 8.—Miscellaneous plate orders are small but make up a good aggregate. The Cleveland pipe line tonnage probably will reach a local mill's order books within a day or two, Biggs Boiler Works Co. not yet having specified the 1400 tons required. From 1.80c to 1.85c, Pittsburgh, is quoted.

CONTRACTS PLACED

5900 tons, sheet piling, dyke for Hartford, Conn., to Bethlehem Steel Co.

CONTRACTS PENDING

2200 tons, 30 to 72-inch pipe, Erie, Pa. Bids April 29.
1000 tons, 60-inch pipe, Boston. Bids April 17.
800 to 1000 tons, tugs, Great Lakes shipyards.

G. F. Davie Is Dead

George F. Davie, 69, vice president and treasurer of Interstate Iron & Steel Co., Chicago, died in a hospital at Chicago, April 8, following a brief illness. He had just returned from a trip to Florida and was about to retire from active business. In his official capacity he had charge of raw material purchases and was regarded as an authority on the adoption and use of raw materials in the making of steel. With the late S. J. Llewellyn and George Stewart, Mr. Davie founded the Interstate company 25 years ago, having previously been connected with Emlin Iron Works, Chicago, which later was absorbed by the Interstate company. He was a native of Boston but received his early education and normal training in Chicago. He was widely known among steel executives and was a member of the American Iron and Steel institute. One of his two sons, Weston E. Davie, is service manager of the wire products division of Interstate Iron & Steel Co.

Discusses Southern Iron

Addressing the New England Foundrymen's association in Boston, April 9, Russell Hunt, sales manager, Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., traced the development of the blast furnace in Alabama and showed how iron produced in the Birmingham area actually constitutes the major portion of what is referred to as "southern iron." Mr. Hunt, in his paper, "Southern Iron in 1930," outlined the rise and fall of the charcoal blast furnace in this country and pointed out that of all blast furnace plants founded 50 years ago in the Birmingham district, only two have been abandoned and these now are occupied by large and modern iron-making units. This, Mr. Hunt claimed to be a 50-year record unequalled anywhere in the world.

Pipe

Awards Drop—Inquiries Fair—Prices Firm—20,000 Tons Steel Line Pipe Divided Among Three

RECENT bookings equip foundries with good backlogs for steady and full operation. Past week's awards, however, were lighter but large lots are pending, including 1000 tons for Chicago, 2400 tons for Brooklyn, N. Y. yards, 2211 tons for Milwaukee, and 1500 tons each for Worcester and Holyoke, Mass. Three steel pipe lines, 37, 62 and 218 miles long, respectively were awarded.

PIPE PRICES, PAGE 92

New York, April 8.—A moderately good tonnage of cast pipe is pending, although orders over the past week have been light. The lot of approximately 2400 tons of 8 and 12-inch cast pipe for the department of water supply yards in Brooklyn, N. Y., continues outstanding. Prices are unchanged.

Boston, April 8.—Cast pipe conditions are exceedingly satisfactory. Private buying remains good. Foundries are booked to their capacity and have enough business to go through the year so that prices are holding firm, $37 to $38, base. R. D. Wood & Co. was low on 1500 tons for Holyoke, Mass., and was awarded 450 tons for Walpole, Mass., the 250 tons for Worcester, Mass., went to Warren Foundry & Pipe Co., Worcester, Mass., opened bids April 7 on 1500 tons.

Pittsburgh, April 8.—Standard pipe demand is slow to improve despite expansion in building operations. Business is slightly ahead of the March rate but lacks usual seasonal activity. Line pipe continues active but local mills benefit little by recent awards. Sinclair Pipe Line Co. placed 37 miles of 10-inch seamless pipe with the Youngstown Sheet & Tube Co. A 62-mile line of 10¾-inch pipe was placed by Union Management Corp., with A. O. Smith Corp. The much-discussed Texas to Chicago line gradually is taking form with definite announcement of plans for its construction. This 950-mile 22-inch line involves around 200,000 tons and while the Smith corporation is understood to be working on part of this line, some tonnage remains to be placed. Little improvement is noted in demand for oil country goods or in locomotive and boiler tubes and mechanical tubing. Mill operations generally continue around 40 per cent.

Youngstown, O., April 8.—Republic Iron & Steel Co. has received several contracts for small diameter line pipe to be made by its new electric welding process. These orders individually involve 25 to 40 miles of 4 to 8-inch pipe. Included is a 218-mile line of 4 and 6-inch to be used in the Louisiana-Birmingham natural gas line. This will be made on the Republic company's new electric welding mill at Lansingville, O. A larger mill for 12 to 14-inch pipe will be ready to operate late this month or early in May. Last week only a few valley pipe mills were in operation. Recent bookings enable both important makers to advance to a 65 per cent basis.

Cleveland, April 8.—Standard full weight merchant pipe tonnage has not measurably improved. Jobbers can get overnight shipments and hence do not anticipate requirements, even though they are entering what should be the busiest building period of the year.

Chicago, April 8.—Numerous orders for cast pressure pipe in one to five carload lots are reported. A local producer sold about 500 tons of 6 and 8-inch pipe for contractors' work at Toledo, O. The 1000 tons of 16-inch cast pipe for Chicago remains open. Quotations on 6 to 24-inch for local delivery remain at $45.20 to $46.20.

Birmingham, Ala., April 8.—Lettings of cast pipe have been steady so that order books show good backlogs. Two foreign orders are noted among numerous lettings recently received, 100 tons for Chile and 147 tons for Manila, P. I. Shops here expect active business through the spring and summer. This district's plant capacity has been materially increased in the past few months and plans are announced for further development.

CONTRACTS PLACED

8000 feet, 6 to 12-inch pipe for Muskegon, Mich., to McWane Cast Iron Pipe Co.

3000 feet, 6-inch cast pipe for Marshfield, Wis., to American Cast Iron Pipe Co.

1698 tons, cast pipe, Pasadena, Calif., allocated as follows: 1072 tons, 24-inch class C, to C. G. Claussen & Co., and 626 tons, 6 to 12-inch, class 150 to 250, to United States Pipe & Foundry Co.

800 tons, 6, 10 and 12-inch cast pipe, Edmonton, Alta., to a Toronto, Ont., foundry.

605 tons, 10 to 24-inch cast pipe, class B, 200 to 257, Alhambra, Calif., to United States Pipe & Foundry Co.

500 tons, 6 and 8-inch cast pipe for contractors' work at Toledo, O., to James B. Clow & Sons.

450 tons, 6 to 12-inch cast pipe, Walpole, Mass., to R. D. Wood & Co.

333 tons cast pipe, class C for Neenah, Wis.: Including 121 tons 12-inch, 88 tons 10-inch, 52 tons 8-inch and 72 tons 6-inch, to James B. Clow & Sons on their bid of $17,000, or $45 to $47 per ton.

300 tons, 10 to 20-inch cast pipe for Kenosha, Wis., to Lynchburg Foundry Co.

250 tons, 6 to 10-inch cast pipe, Marlboro, Mass., to Warren Foundry & Pipe Co.

164 tons, cast pipe, sewer in Summerland street, Southgate, Calif., to unnamed interest.

135 tons, 6 to 12-inch cast pipe, class B, improvement of Tamarack street, San Diego, Calif., to unnamed interest.

127 tons, 6-inch cast pipe, class 150, San Francisco, to United States Pipe & Foundry Co.

100 tons, monocast, Calgary, Canada, to American Cast Iron Pipe Co.

STEEL PIPE AWARDS

10,000 tons, approximately, 218 miles of 4 and 6-inch gas line pipe for the Louisiana-Birmingham natural gas line, to Republic Iron & Steel Co.

4500 tons, 62 miles of 10¾-inch line pipe for Union Management Corp., to A. O. Smith Corp.

3700 tons, 37 miles of 10-inch seamless pipe for Sinclair Pipe Line Co., for a line to Oklahoma City, Okla., pool, to Youngstown Sheet & Tube Co.

3000 tons 8-inch steel line pipe, Standard Oil Co., to Youngstown Sheet & Tube Co.

CONTRACTS PENDING

2211 tons cast pipe, class C for Milwaukee: Including 609 tons 36-inch, 26 tons 42-inch; 1335 tons 48-inch, 27 tons 36-inch, 58 tons 42-inch, 56 tons 48-inch, 3 tons 30-inch, and 97 tons of special castings, 20, 30, 36, 42 and 48-inch; bids close April 15.

1500 tons, 6 to 24-inch cast pipe, Worcester, Mass.; bids opened April 7.

1500 tons, 6 to 12-inch cast pipe, Holyoke, Mass.; R. D. Wood & Co., low bidders.

1500 lengths, 6 and 8-inch cast pipe, Ridgewood, N. Y.; bids in.

617 tons, 4 to 12-inch cast pipe, Santa Ana, Calif.; bids April 7.

500 tons, 12-inch cast pipe, Manhattan, N. Y.; Riverdale Water Co. low.

200 tons, 6-inch cast pipe, Yonkers, N. Y., bids April 10.

194 tons, 10-inch cast pipe, class B, improvement Ridgeway road, San Diego, Calif.; no bids received.

150 tons, 6-inch cast pipe, Bloomfield, N. J.; bids in.

100 tons, 8-inch cast pipe, Andover, Mass.; bids opened April 7.

STEEL PIPE PENDING

1037 lineal feet, 52-inch steel pipe for city water department, Tacoma, Wash.; general contract to Birchfield Boiler Co., Tacoma.

Unstated tonnage, 40 miles 10-inch steel line pipe; inquiry out in New York.

Tin Plate

Seasonal Increase Noted in Shipments —New Orders Small

TIN PLATE PRICES, PAGE 92

Pittsburgh, April 8.—Tin plate specifications are sufficient to provide mills with steady operations at about 85 per cent. Backlogs are light, however, and canmakers are not disposed to take more material than necessary at this time. Shipments show the usual seasonal increase over March, however, and prospects continue favorable for further improvement. Little new business is appearing, with the market continuing $5.25 per 100-pound base box, Pittsburgh.

Ores Lead Imports

Philadelphia, April 8.—Imports at this port during the week ending April 5 included: 295 tons, iron ore, Germany; 1000 tons chrome ore, Portuguese Africa; 500 tons chrome ore, British South Africa; 273 tons steel bearing bars, Sweden; 24 tons steel bearing tubes, Sweden; structural shape imports included 42 tons from France and 50 tons from Belgium. Pig iron was imported to the extent of 1249 tons from British India.

Sheets

Miscellaneous Requirements Increasing Faster Than Automotive —Some Prices Are Easier

A MODERATE increase is apparent in demand for sheets for miscellaneous requirements. Builders of farm implements and road machinery and makers of barrels are especially active. Shipments of automotive sheets are gaining, but at a slower rate than other lines. Some consumers are buying black sheets at 2.55c. Blue annealed have been reduced $2 in the Chicago area.

SHEET PRICES, PAGE 91

Pittsburgh, April 8.—Sheet business is steady but at a better rate than a month ago. Automotive tonnage remains light for this period but a fair improvement is noted in demand over the past 30 days. Demands from farm implement builders and practically all other leading consumers are in fairly heavy volume. Buying of roofing material is slow to expand. Prices continue fairly steady. Black sheets generally are 2.65c, although 2.55c, continues to be done in the Detroit district. Galvanized sheets are 3.30c, with blue annealed continuing 2.25c and 2.10c. Autobody generally are 3.80c.

New York, April 8.—Efforts to obtain the recently announced higher prices on sheets for the current quarter appear abandoned, with the market on galvanized holding at 3.25c to 3.30c, Pittsburgh, and black at 2.60c to 2.65c. The lower prices usually apply to special tonnage. Blue annealed plates are unchanged at 2.10c, Pittsburgh, and blue annealed sheets at 2.25c. Trading is sluggish.

Philadelphia, April 8.—Strip sheet usually is 1.90c, base, Pittsburgh, subject to occasional differentials for quantity. Ordinary black sheets continue 2.65c, with occasional concessions on highly finished material taking extras. Galvanized sheets continue 3.30c, although not much test is afforded. Blue annealed sheets are 2.10c and blue annealed plates 2.25c, subject to occasional differentials.

Buffalo, April 8.—Heavy pressure on black sheet prices is noted, it being reported that some outside producers are quoting prices $2 a ton under former minimum levels. District sheet mills continue to operate at better than 80 per cent.

Youngstown, O., April 8.—New orders for common grades of sheets are slightly larger. Three additional independent units have been started, increasing the operating rate to 79 per cent against 74 per cent last week. Some fair releases of autobody sheets are noted. Black sheets are holding around 2.65c, Pittsburgh; galvanized are 3.25c to 3.30c; autobody 3.80c, and blue annealed about 2.10c.

Cleveland, April 8.—An increase in sheet specifications from barrel manufacturers and various other lines, including metal furniture, is noted. Autobody sheets still lag, although a body plant here gradually is stepping up its output. A few metal furniture plants have ordered material for delivery May 1. Barrel manufacturers are able to buy black sheets at 2.55c, but the bulk of the tonnage sold here is going at 2.65c, Pittsburgh. Some black sheets carrying attractive pickling and other extras were sold in the Detroit district at 2.55c. Furniture sheets bring 3.90c, autobody 3.80c, galvanized 3.30c, and blue annealed 2.10c and 2.25c, for No. 13 and No. 10 gage, respectively.

Detroit, April 8.—Sheet specifications continue spotty but reflect a slight upward tendency. Receipts in this district in April are expected to develop a moderate improvement over March. Some recent specifications have been ear-marked "rush." A few tonnage buyers are getting black sheets at 2.55c, Pittsburgh, although some makers claim that 2.65c is their minimum. Autobody sheets generally are 3.80c, Pittsburgh.

Cincinnati, April 8.—Sheet mills are maintaining production at about 60 per cent. Automotive specifications remain low. Quick delivery is demanded on most orders.

Chicago, April 8.—A St. Louis district producer of galvanized sheets has closed some sales for second quarter at 3.50c, Gary, for No. 24 gage, but it is understood the price generally for April delivery is 3.40c. Efforts are being made to establish a 3.50c price for May and June. The mill price for No. 24 black now is 2.75c, instead of a range of 2.75c to 2.80c. Quotations also are easier for blue annealed sheets, the base mill price for No. 10 gage being 2.20c. No. 13 gage also is weaker at 2.35c, Chicago district mills. These prices for blue annealed sheets represent a drop of $2 a ton. Deliveries on all grades are two to three weeks, and a moderately steady flow of short range specifications is reported.

St. Louis, April 8.—Sheet business since April 1 has been featured by a fair improvement in specifications, and a better volume of new orders. Operations in this district are steady, but a slight enlargement of unfilled tonnage is reported. Blue annealed sheets are showing more activity, and the demand for heavy corrugated roofing material from the South has increased. Prices are unchanged.

Largest concrete bar contract since January, 1929, was let recently to Concrete Steel Co.—7800 tons for a seawall at Lake Pontchartrain, La.

Structural Shapes

Bridges Still Occupy Important Place in Building Activity—Industrial Expansion at Low Ebb—1.80c, Pittsburgh, More Prevalent

VARIED construction effort is represented in the past week's awards and in new inquiries, although bridge work continues in a dominating position. Bridges were let in Texas, Wisconsin, Maryland, Michigan and elsewhere, and a 7500-ton bridge is up at Chillicothe, Ill. A 2300-ton viaduct is pending at Long Island, N. Y. The Maryland bridge took 1600 tons. A San Francisco hospital 1400 tons, a Long Beach, Calif., auditorium, 1300 tons; the Racine, Wis., court house, 1400 tons; and an 1800-ton school at New York were let. A 3000-tons school is up on Long Island. Various office buildings take 500 to 5000 tons. Industrial work still is scarce, although a 2400-ton plant was awarded in New York. Three public buildings 4500, 1850 and 1800 tons, respectively, also were let.

STRUCTURAL SHAPE PRICES, PAGE 91

New York, April 8.—Aside from pending subway work, structural demand here continues restricted to relatively small tonnages. Figures just issued by the Structural Steel Board of Trade show 28,937 tons placed in the metropolitan district in March, exclusive of bridges, piers and subways. This compares with 38,535 in February and 34,951 in January. The total for the quarter is 102,423 tons, against 124,238 tons in the corresponding period, 1929, and 232,769 tons in the last quarter, 1929. Plain material is quoted 1.995c to 2.045c, New York, with shading noted from that minimum.

Boston, April 8.—Only two jobs, 250 and 100 tons, respectively, were reported by structural shape fabricators last week. They continue, however, to receive a good assortment of small tonnages. An office building for the state to be erected in Boston will require 500 tons.

Philadelphia, April 8.—Shape market is unchanged here with plain standard material 1.75c to 1.85c, base, eastern mill, equivalent to 1.81c to 1.91, delivered Philadelphia, but the minimum figure is heard more frequently. Thin web, wide flange sections bring an average of $2 a ton above standard material.

Pittsburgh, April 8.—Structural shape awards in this district are light, although local fabricators have booked a fair number of jobs in other districts. Specifications for plain material are well maintained at the March rate although inquiry indicates no substantial improvement over the next 30 days. Plain shapes generally are 1.80c, Pittsburgh, with 1.85c applied on only a small portion of tonnage.

Cleveland, April 8.—Estimates of construction effort under contemplation in the greater Cleveland area vary between $50,000,000 and $75,000,000 worth. Owners and contractors, however, are slow to reach the point where structural steel awards are made. Another catenary bridge order, 200 tons, went to American Bridge Co. Otherwise awards are negligible. While an effort still is made to obtain 1.85c, Pittsburgh, on plain material, 1.80c is done from time to time. Large projects at Akron and Toledo, O., still are deferred. New inquiries come out slowly, most of the work now up for attention having been before bidders for some time.

Chicago, April 8.—Structural mills continue to benefit from car shop specifications against old orders for light shapes. The possibility that New York Central may issue a large car inquiry within the next week gives further promise. Industrial, bridge and public building work furnish almost the sole activity in shapes aside from manufacturing lines. The 4000 tons for the Morrison hotel addition, in Chicago, is awaiting the return of one of the architects from the South. Inquiries total 11,000 to 12,000 tons, and awards amount to 3500 to 4000 tons. Structural mill operations are 70 to 75 per cent. Plain material deliveries are two to six weeks. The base price is 1.90c, Chicago.

Birmingham, Ala., April 8.—Large size structural steel contracts are infrequent. Several specifications which should come to Birmingham are in sight for early award, including hotels at Atlanta, Ga., and Mobile, Ala., as well as other structures. Virginia Bridge & Iron Co. was awarded 260 tons for an underpass under railroad tracks here. Active plant operation is necessary to rush deliveries and some night work is being done.

CONTRACTS PLACED

4500 tons, Central court house, Brooklyn, N. Y., to George A. Just Co.

2400 tons, (column cores included) factory, Hudson, Charlton and King streets, New York, to Levering & Garrigues Co.

1850 tons, post office addition, Milwaukee, to McClintic-Marshall Co.

1800 tons, public school No. 98, New York City, to Easton Structural Steel Co.

1600 tons, bridge, Arundel Corp., Baltimore, to Bethlehem Steel Co.

1500 tons, building, Potomac Electric & Power Co., Washington, to Barber & Ross Inc.

1400 tons, hospital at Presidio, San Francisco, to Dyer Bros.

1400 tons, court house, Racine, Wis., to Wisconsin Bridge & Iron Co.; Holabird & Root, Chicago, architects; bids on remainder of work to close April 24.

1300 tons, auditorium, Long Beach, Calif., to Minneapolis-Moline Power & Implement Co.

830 tons, bridge, Rochester, N. Y., to McClintic-Marshall Co.

750 tons, building, Southern New England Telephone Co., Waterbury, Conn., to Levering & Garrigues Co.

680 tons, building, First National bank, Scranton, Pa., to Anthracite Bridge Co.

650 tons, bridge, Pere Marquette railroad, Port Huron, Mich., to American Bridge Co.

600 tons, transmission towers, Wisconsin Power & Light Co., Sheboygan, Wis., to American Bridge Co.

570 tons, bridges, Long Island railroad, Long Island, N. Y., to Bethlehem Steel Co.

500 tons, McKee street bridge, Houston, Tex., to Wisconsin Bridge & Iron Co.

500 tons, Gotfried bakery, 600 West Fifty-first street, New York, to Harris Structural Steel Co., through White Construction Co., general contractor.

500 tons, Pennsylvania railroad bridge, Corona, Long Island, N. Y., to Bethlehem Steel Co.

460 tons, building, government airport, Sand Point, Seattle, to Hofius Steel & Equipment Co.

400 tons, bus terminal, North Side, Pittsburgh, to Guibert Steel Co.

400 tons, subway and bridge work for Chicago, Milwaukee, St. Paul & Pacific railroad, at Milwaukee, to Milwaukee Bridge Co.

400 tons, city hall, Racine, Wis., to Wisconsin Bridge & Iron Co.

400 tons, school, Eleventh and Catherine streets, Philadelphia, to Robinson Iron & Steel Co.

375 tons, miscellaneous state bridge work, West Virginia, to American Bridge Co.

375 tons, bridge, Wausau, Wis., to Wausau Iron Works.

350 tons, hangar No. 4, Alameda Airport Co., Alameda, Calif., to Western Iron Works.

320 tons, bridge, Somerset county, Pennsylvania, to McClintic-Marshall Co.

300 tons, Dix avenue grade crossing elimination, Detroit, to McClintic-Marshall Co.

260 tons, apartment, Swarthmore, Pa., to Bethlehem Fabricators Inc.

260 tons, grade crossing, Reading railroad, Chestnut Hill, Pa., to McClintic-Marshall Co.

260 tons, underpass in Birmingham, Ala., with city and railroads co-operating, to Virginia Bridge & Iron Co.

250 tons, central heating plant, New York, New Haven & Hartford railroad, New Haven, Conn., to Palmer Steel Co.

250 tons, 6-story addition, 43 West Thirty-fourth street, New York, to A. E. Norton Inc.

245 tons, building, Reading Trust Co., Reading, Pa., to Baumann Iron Works.

200 tons, catenary towers, Cleveland Traction Terminals Co., Cleveland, to American Bridge Co.

200 tons, coke oven work, Weirton Steel Co., Weirton, W. Va., to McClintic-Marshall Co.

200 tons, telephone building, Bradford, Pa., to McClintic-Marshall Co.

Awards Compared

	Tons
Awards this week	30,520
Awards last week	25,617
Awards two weeks ago	26,426
Awards this week in 1929	78,331
Average weekly awards, 1930	32,086
Average weekly awards, 1929	38,603
Average weekly awards, Mar.	27,797
Total awards to date, 1929	621,465
Total awards to date, 1930	481,285

200 tons, bridges, Pennsylvania railroad, to American Bridge Co.
200 tons, poor house, York, Pa., to Steel Service Co.
175 tons, beams, Pennsylvania railroad improvements, West Philadelphia, Pa., to Belmont Iron Works.
150 tons, Naval Reserve armory, East Jefferson and Baldwin avenues, Detroit, to R. C. Mahon Co.
150 tons, school building, Buffalo, to Buffalo Structural Steel Co.
110 tons, building, Auto club, Los Angeles, to Consolidated Steel Corp.
100 tons, Boys' clubhouse, Portland, Me., to McGuire & Jones.
100 tons, court building, Queens, N. Y.; to George J. Schnatz Iron Works.
100 tons, hangar, Curtis-Wright Co., Alameda, Calif., to Pacific Coast Engineering Co.

CONTRACTS PENDING

7500 tons, bridge for Santa Fe railroad over Illinois river at Chillicothe, Ill.
3500 tons, state office building, Columbus, O.; Harry Hake, 2400 Gilbert avenue, Cincinnati, architect; Frank Bail, Hanna building, Cleveland, associate architect.
3000 tons, Ridge avenue subway, Philadelphia; Joseph and Robert Lombardi, low bidders.
3000 tons, approximately, Grover Cleveland high school, Stanhope street, Ridgewood, Long Island, N. Y.; bids open April 22.
2300 tons, approach to the Queensboro viaduct, Long Island City, N. Y.
2000 tons, underground concourse, Philadelphia; Keystone State Construction Co. low bidder.
1200 tons, theater and office building in Milwaukee.
1200 tons, 16-story office building, 29 West Forty-seventh street, New York.
1000 tons, law building, Jersey City, N. J.
1000 tons, shop building for Allis-Chalmers Mfg. Co., Milwaukee.
630 tons, theater, Warner Bros., Erie, Pa.; bids in.
500 tons, state office building, Boston.
500 tons, miscellaneous state bridge work, Pennsylvania.
500 tons, theater, Warner Bros., Youngstown, O.; bids being taken.
450 tons, highway bridges for Illinois state highway department.
400 tons, Y. M. C. A. building, New Rochelle, N. Y.; Louis E. Jallade, New York, architect.
400 tons, building for University of Chicago, Chicago.
375 tons, bridge over Mojave river, Sacramento, Calif.; bids April 23.
250 tons, state highway bridge, Maine.
200 tons, 7-story building, Bickford Lunch Co., 736 Ninth avenue, New York.
175 tons, Home for Widows, Philadelphia.
165 tons, Harris theater and office building, Monessen, Pa.; bids in.
150 tons, Sisters of Charity building, Charity hospital, Cleveland; George S. Rider Co., architect; general contract to Lundoff-Bicknell Co.
150 tons, 4-story office building, Pearl and Moore streets, New York.
100 tons, auditorium, St. Johnsbury, Vt.
100 tons, building, Peoples Building & Loan association, Ashtabula, O.; general contract to Hutter Construction Co., Fond du Lac, Wis.
100 tons, dormitory, Babson institute, Wellesley, Mass.
100 tons, west wing addition, high school, Lee and Cedar roads, Cleveland Heights, O.; plans being prepared by John H. Graham & Co., architects.
Unstated tonnage, additional buildings, Palmer Match Co., Akron, O.; Hannah & Sterling, Pittsburgh, architects.
Unstated tonnage, E. Roberts' publishing plant, *St. Louis Star*, St. Louis, to cost $1,500,000; plans about ready to proceed.

Harvester Earnings Rise

The International Harvester Co., Chicago, manufacturer of farm implements, reports net earnings for 1929 of $36,779,997, or $7.10 a share on the common stock, compared with $28,685,350, or $5.58 a share in the previous year. President Herbert E. Perkins said the company last year did the largest volume of business in its history.

Concrete Bars

Large Projects Bid Upon Each District—Road Work Leads Week's Awards

PRACTICALLY each market center reports at least one outstanding job. A 3500-ton bridge is up at Los Angeles; a 2500-ton tunnel is pending at Galesburg, Ill.; a 1750-ton bridge is out for bids at East Pittsburgh, Pa.; a 1000-ton insurance building is up at Milwaukee; a 1500-ton elevated roadway is up at New York. About 2000 tons of road work was let in Indiana and Wisconsin.

REINFORCING BAR PRICES, PAGE 91

Chicago, April 8.—A large amount of industrial building and road work dominates the reinforcing bar market. The 2500-ton lot for the tunnel of the Galesburg, Ill., sewage treatment works remains pending. Bids are being held under advisement since they exceed the appropriation. Whether the tunnel will be re-designed has not been announced. The general contract for the 135-ton sewage disposal plant building was let. Other pending work includes an insurance building at Milwaukee, 1000 tons; turbine foundations for a power plant building at Waukegan, Ill., 370 tons. Indiana and Wisconsin awarded about 200 tons of reinforcing bars for road work. Billet reinforcing bars are quoted 2.00c for lots of 30 tons and over.

March building permits for Chicago total 233 units, costing $4,649,800, a decrease of 504 in number and $15,873,700 in value from March, last year.

Boston, April 8.—Only minor changes were noted in concrete bars last week. Price softness appears. Possibly 200 tons in small lots was ordered, but a verbal contract for 400 tons for the Bowdoin Square telephone exchange, this city, was placed and formal award is scheduled for this week. Other jobs are being figured.

New York, April 8.—Prices on concrete reinforcing bars for shipment in cut lengths now range generally from 2.00c to 2.10c, base, Pittsburgh, on carload lots. The minimum applies on desirable business. Several good size lettings lead market activity here, topped by 700 tons for a library building in Brooklyn. For shipment out of warehouse stocks 2.60c to 2.70c, base, delivered locally are prices named.

Buffalo, April 8.—Demand for reinforcing steel continues slow due to a tendency to defer spring buying. Some inquiries which ordinarily would have been covered in the late winter are still pending and mill schedules can not be advanced materially until business develops beyond its small first quarter proportions. Large purchases of mesh for road construction are expected later this month.

Pittsburgh, April 8.—Concrete bar orders show little further improvement but remain fairly large for this period. The outlook for April and May is favorable. Awards and inquiries usually are made up of small individual tonnages. A county bridge at East Pittsburgh, however, will require 1750 tons. The market continues 1.85c, Pittsburgh, for stock lengths and 2.10c for cut lengths.

Awards Compared

	Tons
Awards this week	8,640
Awards last week	5,410
Awards two weeks ago	16,208
Awards this week in 1929	7,365
Average weekly awards, 1929	5,849
Average weekly awards, 1930	6,538
Average weekly awards, Mar.	10,172
Total awards to date, 1929	96,318
Total awards to date, 1930	98,073

CONTRACTS PLACED

1000 tons, road work in Indiana, to several mills.
1000 tons, road work in Wisconsin, to several bidders.
950 tons, school, Eleventh and Catherine streets, Philadelphia, to Kalman Steel Co.
750 tons, Ohio river boulevard, Pittsburgh, to McClintic-Marshall Co.
700 tons, Henry avenue bridge, Philadelphia, to Taylor-Davis Inc.
700 tons, Central library building, Brooklyn, N. Y., to McClintic-Marshall Co., through Fredburn Construction Co.
500 tons, addition to post office, Milwaukee, to Truscon Steel Co.
450 tons, building, Central Public Service Corp., Springfield, Ill., to Laclede Steel Co.
400 tons, department store building, Fraser-Paterson Co., Seattle, to Northwest Steel Rolling Mills.
335 tons, highway bridge, Bedford county, Pennsylvania, to McClintic-Marshall Co.
250 tons, waterworks, Shreveport, La., to Laclede Steel Co.
250 tons, building, National Lock Washer Co., Newark, N. J., to Igoe Bros.
250 tons, Pennington avenue bridge, Baltimore, to McClintic-Marshall Co.
200 tons, Pine Realty building, Seattle, to Northwest Steel Rolling Mills.
170 tons, Exchange street viaduct, Oklahoma City, Okla., to Laclede Steel Co.
150 tons, subway route 109 section 3, Brooklyn, N. Y., to McClintic-Marshall Co., through Thompson Leopold Fredburn Engineering Corp.
150 tons, grain elevator, Pennsylvania railroad, at 106th street and Calumet avenue, Chicago, to Inland Steel Co.
120 tons, building, Paterson Parchment Paper Co., Edgely, Pa., to Truscon Steel Co.
115 tons for Empire State building, New York, to Concrete Steel Co.
100 tons, bridge, Baltimore & Ohio railroad, Laughlin Junction, Pittsburgh, to Fort Pitt Bridge Works.

100 tons, school, Des Moines, Iowa, to Concrete Steel Co.

CONTRACTS PENDING

3500 tons, Fourth street bridge, Los Angeles; bids opened.

1750 tons, Westinghouse bridge, East Pittsburgh, Pa.; bids on general contract close April 12.

1500 tons, ramps, approaches and floor, west side elevated highway, first section, West street, New York; James Stewart & Co. low bidders on general contract.

1000 tons, Northwestern Mutual Life Insurance Co. building, Milwaukee, general contract to Ralph Sollitt & Sons Construction Co.

500 tons, United States Veterans' hospital, Dayton, O.

400 tons, Central Y. M. C. A. building, Seattle; bids in.

220 tons, turbine foundations, Public Service Co. of Northern Illinois, Waukegan, Ill.

130 tons, bridge over Mojave river, Sacramento, Calif.; bids April 23.

125 tons (mesh), for Transit road, Buffalo; Stapell, Mumm & Beals, Hamburg, N. Y., low bidder.

Unstated tonnage, administration building, Century of Progress exposition, Chicago; concrete bar work; plans out about April 15; bids being received now on general contract.

Pig Iron

(*Concluded from Page* 93)

duction in this district is at a higher rate than in any month in the past ten years, except March, 1927, and December, 1926. Sales are larger than the output, and iron is being shipped from surplus. Two blast furnaces are being prepared for operation if needed. The melt in Alabama is increasing. Prices are steady.

Chicago, April 8.—Pig iron buyers are ordering conservatively and a large share of the usual quarterly bookings is lacking. April order books are well filled. Automotive releases to malleable foundries are gaining slightly and furnaces expect a substantial increase in shipments this month over March. Ford Motor Co. orders are distributed to such an extent that their effect on individual units of the malleable industry is scarcely perceptible. A Wisconsin implement maker purchased 2000 tons of northern and southern foundry iron for several of its plants. Sales of base grades of southern iron are being made at $18.20 to $19.01, delivered, Chicago. Furnace interests here quote $19.50, base, Chicago furnace.

Philadelphia, April 8.—Two consumers in this district have placed a total of 12,000 to 15,000 tons of basic iron. This grade now ranges from $18.76 to $19.25, delivered in this district. Several small and large lots of low phosphorus iron have been bought at unchanged prices. The market for foundry iron is quiet, with prices continuing $19.50 to $20, base, eastern Pennsylvania furnace.

The first steel made in western Pennsylvania was produced in 1811 by Morris Truman & Co. at Brownsville and sold at about $240 a ton in spite of the fact that it was of rather poor quality.

Rails, Cars

Car Buying Quiet, Prospects Brighter—Most Awards for Repairs—Rail Buying Disappears

EXPECTED large car inquiries have not yet put in their appearance but are scheduled for later in the week. Reading bought 70 coaches, Erie ten switch engines. Pacific Fruit Express wants 500 steel underframes; Virginian repairs for 500 hoppers; Wilson & Co. 100 to 300 refrigerator cars; and L. C. L. Corp. 100 drop side containers. Two roads bought 225 cars.

RAILROAD TRACK PRICES, PAGE 92

Chicago, April 8.—Shipping orders for rails and other track material have been extended by the railroads over a broader period than in recent years. Rail mills and track fastenings departments remain at practical capacity. Track fastenings sales in the week just ended were 2000 to 3000 tons. Several important quarterly contract orders for track accessories have been let. It is indicated western mills will get about one-half of the Pennsylvania railroad's second quarter fastenings tonnage, 10,000 tons. Secondary rail buying is not expected to start here for about 60 days.

Reports are that New York Central may issue its 10,000-car inquiry within a week. No date has been set by Illinois Central for the receipt of bids for its 2330 new units.

Pittsburgh, April 8.—Several small inquiries for track material are appearing but pending business generally is quiet. Specifications are fairly active for this period, however, several releases having been received against orders held up a short time ago. The freight car market remains quiet. Some prospective equipment recently discussed is not yet actively pending. Light rail demand is dull.

New York, April 8.—Freight car demand continues light, with approximately 1300 freight and 45 passenger cars actively pending. Specifications are expected out shortly on Illinois Central and Pacific Fruit Express lists.

CAR ORDERS PLACED

Chicago, Milwaukee, St. Paul & Pacific, two air dump cars, to Western Wheeled Scraper Co.

Green Bay & Western, 125 box cars, to Bettendorf Co.

Missouri, Kansas, Texas, 100 ballast cars, to General American Car Corp.

Reading Co., 70 coaches, to Bethlehem Steel Co.; 25 additional coaches for Central Railroad of New Jersey expected to be closed shortly.

LOCOMOTIVE ORDERS PLACED

Erie, ten switch engines and five extra tenders, to Baldwin Locomotive Works.

CAR ORDERS PENDING

Central Railroad of New Jersey, five passenger-baggage cars in addition to 25 noted in IRON TRADE REVIEW of Feb. 20.

Dallas Power & Light Co., one transformer car.

Erie, five all steel express cars.

L. C. L. Corp., 100 dropside 50-ton container cars.

Minneapolis & St. Louis, unstated number of gasoline-electric railmotor cars, in addition to 500 box cars noted last week.

Pacific Fruit Express, 500 steel underframes for refrigerator cars.

Reading, ten baggage cars additional.

Standard Oil Co. of New Jersey, four tank cars.

Virginian, repairs to 500 55-ton all-steel hopper cars.

Wilson & Co., 100 to 300 refrigerator cars.

LOCOMOTIVE ORDERS PENDING

Peoria & Pekin Union, two switch engines.

Republic Announces Its First Stock Issue

New York, April 8.—Consummation of the Republic Steel Corp. merger followed approval of the stockholders of four constituent companies at meetings held here yesterday and today. The initial capitalization will consist of an issue of $60,000,000 of 6 per cent cumulative convertible preferred stock having a par value of $100, out of an authorized issue of $150,000,000. Common stock will be offered to the extent of 198,212 no par shares of an authorized issue of 5,000,000 shares. The new company will have an outstanding assumed funded debt of $58,335,800 in addition to $5,000,000 of subsidiary company preferred stock. Tom M. Girdler, former president of Jones & Laughlin Steel Corp., will be chairman; E. T. McCleary, formerly president of Republic Iron & Steel Co., is to be president; and F. J. Griffiths, once chairman of the board of Central Alloy Steel Corp., will become president of a subsidiary company to be organized to carry on the corporation's research work. No other officers were announced at this time

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To Hold Power Meeting

The third national meeting of the oil and gas power division of the American Society of Mechanical Engineers will be held at Pennsylvania State college, State College, Pa., June 12-14. Fifteen papers will be presented in five sesions. An exposition of diesel engine accessories will be held in conjunction with the meeting.

Strip

Specifications Light but Better Than Last Month—Some Shading Is Seen in East

USERS of strip steel are taking more material than a month ago but less than usual at this time of year. Automotive slackness is credited with this lack. Mills have only moderate backlogs and many have worked off most of this accumulation. Production rate is unchanged. A hot-rolled contract at Cleveland for a cold-rolled producer proved attractive.

STRIP PRICES, PAGE 92

Pittsburgh, April 8.—Strip steel specifications continue seasonally light despite heavier operating schedules planned by several automotive interests. Strip demand is heavier than a month ago but remains substantially below the usual seasonal level. Backlogs remain moderate and some makers have worked off a large portion of unfilled business accumulated a month ago. The market is definitely on a $2 spread for both hot and cold strip, with the former 1.80c to 1.90c and 1.70c to 1.80c for the two widths of hot and 2.55c to 2.65c for cold strip. Operations are unchanged at 60 per cent for hot strip and 30 per cent for cold.

New York, April 8.—While most sellers of hot strip are endeavoring to hold to a range of 1.80c to 1.90c, Pittsburgh, depending upon widths, shading of 5 points is noted with increasing frequency. Cold strip prices are easier at 2.60c to 2.65c, Pittsburgh. Trading remains light.

Philadelphia, April 8.—Wide hot strip is being quoted at 1.70c to 1.80c, Pittsburgh, and 1.80c to 1.90c for narrow. Cold-rolled strip is at 2.55c to 2.65c, base, Pittsburgh.

Youngstown, O., April 8.—Hot-rolled strip demands continue the nucleus around which local mills are operating at about 65 to 75 per cent. Most of this demand still comes from auto parts makers, with scattering needs being filled in other directions. Cold-rolled strip requirements continue restricted. Hot-rolled brings 1.70c to 1.80c, Pittsburgh, and cold strip is unchanged.

Cleveland, April 8.—One of the most attractive tonnages sold this year both from size and rolling standpoint was specified in hot strip last week by a cold strip producer. This gave this mill the best week of the year so far. The market trend is toward improvment. Some mills still quote 1.80c to 1.90c, base, Pittsburgh, on wide and narrow hot strip, respectively, although $2 less has been done and is being done in Michigan autmotive market. Cold strip is moving a little better and 2.55c, Cleveland, is fairly general, although 2.65c still is done occasionally on small lots.

Chicago, April 8.—Hot-rolled strip mills continue at about 60 per cent, with a fair amount of miscellaneous manufacturing orders. Automotive business shows no improvement. Prices for hot-rolled strip are 1.90c, Chicago, for wide and 2.00c for narrow strips. Cold-rolled strip mills report specifications slightly lower. Prices quoted at Chicago are on the basis of 2.55c to 2.65c, Pittsburgh-Cleveland.

Bethlehem Steel Corp. signed a contract with Spanish Petroleum Co., Madrid, Spain, for design, manufacture and construction of a 5000-barrel gasoline and fuel oil refinery at Santa Cruz de Penerise, Canary Islands.

Cold Finished Steel

Present Demand and Outlook Improved Over Month Ago—Prices Steady

COLD FINISHED PRICES, PAGE 92

Pittsburgh, April 8.—Demand for cold-finished steel bars and shafting is slightly heavier than a month ago, with the outlook improved by heavier specifications in prospect from automotive buyers. Several of the latter have heavier schedules outlined for April although steel purchases as yet have not increased materially. Requirements of other consumers are steady and unchanged. Second quarter contracting is practically complete, with the market continuing at 2.10c, Pittsburgh.

Cleveland, April 8.—Cold-finished bars show little improvement. Large automotive users are specifying better than in March but miscellaneous consuming lines release only small amounts. The 2.10c, Cleveland, price continues firm, however, recent weakness in hot rolled bars not being reflected in the cold-finished product.

Wire

Fencing Aids Market by Steady Sales—Manufacturers' Wire Below Usual Level

MANUFACTURERS' wire is slow, unlike its usual steady pace. Nail distribution is about normal and fencing is holding its own. Eastern producers seem to be taking a better tonnage, while in the West the volume of orders has slackened. Prices are fairly steady and a fairly large tonnage of small orders is supporting the market. Automotive specifications are better.

WIRE PRICES, PAGE 92

Chicago, April 8.—Manufacturers' wire sales remain below a year ago. Orders during the week fell off slightly, but merchant wire products, including woven fencing, have held their own. Jobber and dealer distribution of nails and other common wire products has been about normal. Except for fine magnet wire for radio and automotive manufacture, electrical wire is holding in good volume. Specifications for heavy steel electrical cable products are steady. The jobber price for wire nails is reported at $2.35, Chicago or western mills.

Worcester, Mass., April 8.—Wire production, which fell off in March about 10 per cent under 1929 figures, is showing more strength with heavier specifications from automobile and accessory sources. Prices are firm at 2.55c to 2.65c, base, Worcester, for plain bright wire to dealers.

Philadelphia, April 8.—Second quarter wire nail contracts in this district are on a basis of $2.30, Pittsburgh. Whether lower prices that applied during the first quarter can be obtained now remains to be seen, as many buyers still are supplied on first quarter purchases. Plain wire continues firm at 2.40c, Pittsburgh.

Pittsburgh, April 8.—Demand for manufacturers' wire holds at a slightly better rate than a month ago, although merchant products continue slow. Mills booked a fair volume of the latter during the last week of March, higher prices this month prompting coverage by jobbers. With the removal of old prices, the market is quoted $2.30 for wire nails to jobbers although there is little occasion to place new business at this time. Bright plain wire continues 2.40c. Automotive interests are specifying better. Barbed wire and woven wire fencing remain seasonally quiet.

Cleveland, April 8.—Jobbers and retailers are ordering wire products in better volume. Mixed carloads were more numerous last week for some producers than in any week since the year began. After the heavy orders of a week ago, mills have experienced a letdown in manufacturers' wire. However, miscellaneous small orders keep up fairly well. Price weakness reported in other sections seems absent in this territory now.

Nonferrous Metals

Zinc Prices Advance but Lead Quotations Drop Suddenly Following Recent Recovery—Copper Holds Steady—Tin Falls Off

Prices of the Week, Cents a Pound

	Copper			Straits Tin							
	Electro delivered	Lake delivered	Casting refinery	New York Spot	York Futures	Lead New York	Lead East St. Louis	Zinc St. Louis	98-99% Aluminum	Spot Antimony	Ingot Nickel
April 2	18.00	18.10	17.30	36.85	37.20	5.75	5.60	4.85	23.90	8.00	35.00
April 3	18.00	18.10	17.30	36.60	37.00	5.75	5.60	4.90	23.90	8.00	35.00
April 4	18.00	18.10	17.30	36.30	36.62½	5.60	5.50	4.90	23.90	8.00	35.00
April 7	18.00	18.10	17.30	36.12½	36.50	5.50	5.40	4.97½	23.90	8.00	35.00
April 8	18.00	18.10	17.30	36.37½	36.75	5.50	5.40	4.97½	23.90	8.00	35.00

NEW YORK, April 8.—Strength and weakness are balancing each other in the nonferrous metal market. Zinc prices have advanced about 15 points, but lead and tin quotations have gone down. The decline in the latter was expected by some men in the trade but the quick drop in lead was a surprise.

Copper, aluminum and nickel continue to be outstanding examples of stability. New business in all of the metals is of routine nature, but buyers of copper are venturing slightly farther ahead on orders than heretofore. Sentiment in all of the metals has been somewhat more confident of late, as there have been positive indications of a rising volume of business through the spring. This sentiment, however, has not been helped by weakness in some metal prices.

Copper—Buying continues below normal in the domestic market, but export sales in the past week have been of fair size. Most business is for April shipment but it may be significant that some consumers have bought for a whole month's requirements lately, whereas they had been buying to cover needs extending only a week or 10 days into the future. All sales continue to be made on the basis of 18.00c, Connecticut. Brass mill operations have increased slightly in recent weeks but wire mills have shown little change from the high rate established early in the year. There is much speculative discussion regarding the future of the price, but so far there is no definite indication of any change. March statistics, to be published in about a week, are expected to show another large increase in stocks of refined metal.

Zinc—The market has advanced with a moderate amount of buying from 4.85c, East St. Louis, to 4.95c to 5.00c. The recovery was due in part to the removal of selling pressure which had depressed the market in the past few weeks. This is the first price strength shown by zinc since January. March statistics show that production continues to overbalance consumption, with an increase of over 3300 tons in stocks last month. Total stocks now are much more than two months' supply. Domestic shipments in March were over 44,000 tons.

Tin—Consumer buying has been extremely light in the past week, and confined mostly to nearby shipments. The estimate of unusually large supplies to be made available this month, together with quietness, is the cause of the recession of nearly 2 cents since the latter part of March.

Lead—Seldom has the lead market reversed itself so rapidly as in the past few days. Prices are down ¼-cent following recovery in the latter part of March by the same fraction. Consumption of lead in this country, which has been much nearer to last year's level than that of any other metal, is believed to continue large. Conditions in the European market are anything but favorable, however, and these have forced New York prices down.

Aluminum—The volume of business is a little larger, but prices are firm and unchanged.—*Daily Metal Trade.*

Mill Products

Base price cents per pound f.o.b. mill, except where otherwise specified

SHEETS	
Yellow brass (high)	23.25
Copper, hot rolled	27.75
Lead, full sheets (cut ½c more)	9.25
Zinc sheet (100-pound base)	10.00
Zinc strip (100-pound base)	9.50
Aluminum, flat sheets, up to 10 gage, 3 to 72 inches wide	31.30
SEAMLESS TUBE	
Yellow brass (high)	28.25
Copper	29.25
RODS	
Yellow brass (high, full turnings)	21.25
Naval brass	24.00
WIRE	
Copper	19.87½
Yellow brass (high)	23.75

Old Metals

Dealers' buying prices, cents per pound

HEAVY RED BRASS	
New York	11.25 to 11.75
Chicago	10.75 to 11.25
Cleveland	11.50 to 12.00
St. Louis	10.00 to 10.50
HEAVY YELLOW BRASS	
Cleveland	7.50 to 8.00
HEAVY COPPER AND WIRE	
New York	14.50 to 14.75
Boston	14.00 to 14.50
Chicago	14.00 to 14.25
Cleveland	13.50 to 14.00
St. Louis	10.50 to 11.00
RED BRASS BORINGS	
New York	10.25 to 10.75
YELLOW BRASS TUBING	
Cleveland	7.50 to 8.00
LIGHT COPPER	
New York	12.50 to 13.00
Chicago	12.25 to 12.50
Cleveland	12.50 to 13.00
St. Louis	10.50 to 11.00
LIGHT BRASS	
Boston	6.50 to 7.00
Chicago	6.50 to 7.00
Cleveland	6.00 to 6.50
St. Louis	5.75 to 6.25
ZINC	
New York	2.50 to 2.75
Cleveland	2.00 to 2.50
St. Louis	2.50
ALUMINUM	
Clippings, soft, Cleveland	13.00 to 14.00
Clippings, hard, Cleveland	10.50 to 11.00
Borings, Cleveland	7.50 to 8.00
Cast, Cleveland	9.75 to 10.25
Cast, Boston	9.00 to 9.50
Cast, St. Louis	9.00 to 9.50

Secondary Metals

Remelt aluminum No. 12	16.00 to 16.50
Brass ingot, 85-5-5-5	15.50 to 15.75

Bar Association To Hold Semiannual Meeting

The Rail Steel Bar association will hold its regular semiannual meeting at the Commodore hotel, New York, May 9. This association, organized in 1912, includes in its membership the larger rail steel mills of the United States and Canada, and has for some years held its business meetings in conjunction with the sessions of the American Iron and Steel institute. The association is a technical organization for co-operative research in production methods and the extension of reinforced concrete construction.

Quicksilver Price Lower

New York, April 8.—Quicksilver has gone down several dollars in the past week to $115 a flask. Buying is light.

Contract for approximately 30 miles of wire rope for state highway fences has been awarded Webster & Webster, East Hartford, Conn., on a bid of $78,024.

Coke By-Products

Per Gallon at Producers' Plants in Tank Lots

	Spot
Pure benzol	$0.22
90 per cent benzol	0.22
Toluol	0.35
Solvent naphtha	0.28
Commercial xylol	0.28
Per Pound at Producers' Plants in 250-Pound Drums	
Phenol	0.16 to 0.17
Per Pound at Producers' Plants	
Naphthalene flakes	0.04½ to 0.05½
Naphthalene balls	0.05½ to 0.06½
Per 100 Pounds Delivered	
Sulphate of ammonia	$2.00 to $2.10

Warehouse

Sales Slow With Only Moderate Rise Reported—Larger Purchases Not in Evidence —Building Light—Prices Firm

DEMAND is seasonally light in most districts. Mill deliveries are taking some warehouse sales, though lagging construction, poor general manufacturing demand and other ordinarily heavy takers have not bought the usual early spring volumes. Prices continue quiet except reinforcing bars at Cincinnati and Swedish drill and bar steel in New York.

New York—Jobbing demand has shown a slight gain but is still well under last year's rate. Major items' prices are unchanged, although there are a few variations, including changes in Swedish hollow drill steel and round iron bars.

Buffalo—Mill deliveries are being extended on some materials to a point helping warehouses. First quarter sales ran behind the same period, 1929. With signs of improvement the last few weeks, a betterment in sales volume is looked for the next three months.

Philadelphia—Jobbers report current bookings slightly under the March average. Prices are unchanged and firm.

Pittsburgh—Demand has accelerated slightly but remains seasonally light. Prices are unchanged, with quantity differentials generally being applied although a few jobbers are disregarding them.

Cincinnati—A slight improvement in demand was noted by jobbers last week. Base on reinforcing bars has been advanced to 3.30c.

Cleveland—Lethargy continues in the iron and steel warehouses despite jobbers' efforts to encourage consumption. General buying continues in relatively small lots. Mill bar deliveries have sped up and cut into warehouse volumes. New hot-rolled quantity extras continue unchanged.

Detroit—Numerically, orders are almost equal to last year but the volume of business entailed is considerably lighter. If there is any trend it is toward slight improvement. Lagging building work is reflected in extremely light demand for structural material. Prices are unchanged.

Chicago—A moderate pickup is reported except in sheets. Activity is still light in cold-rolled bars, but hot bars are gaining. Prices remain unchanged.

St. Louis—Business continues its lag, general manufacturing being extremely slow acquiring seasonal momentum. Sentiment has undergone some improvement.

Warehouse Quotations in Cents Per Pound at Leading Market Centers

Hot Mill Products Subject to New Quantity Differentials Adopted March 3, 400 to 3999 Pounds Being Base

STEEL BARS

Baltimore	3.25c
Boston	3.265c
Buffalo	3.30c
Chattanooga	3.25c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.00c
Houston	3.00c
Los Angeles	3.30c
New York††	3.25c
Philadelphia	2.80c
Pittsburgh	2.90c
Portland	3.00c
San Francisco	3.40c
Seattle	3.15c
St. Louis	3.15c
St. Paul	3.25c
Tulsa	3.75c to 4.04c

IRON BARS

Baltimore	3.25c
Boston	3.265c
Buffalo	3.30c
Chattanooga	3.25c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.00c
New York††	3.25c
Philadelphia	2.80c
St. Louis	3.15c
Tulsa	3.75c to 4.04c

REINFORCING BARS

Baltimore	3.31c
Boston	2.665c
Buffalo	2.95c
Chattanooga	3.25c
Cincinnati	3.30c
Cleveland	2.25c to 2.44c
Detroit	2.30c to 3.00c
Houston	3.00c
Los Angeles cl.	2.40c
Los Angeles lcl.	2.70c
New York	2.65c to 3.10c
Philadelphia	2.65c to 3.00c
Pittsburgh	2.75c
San Francisco cl.	2.30c
San Francisco lcl.	2.60c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.75c to 4.00c
Youngstown	2.30c to 2.60c

STRUCTURAL SHAPES

Baltimore	3.25c
Boston	3.365c
Buffalo	3.40c
Chattanooga	3.35c
Chicago	3.10c
Cincinnati	3.40c
Cleveland	3.00c
Detroit	3.10c
Houston	3.25c
Los Angeles	3.30c
New York	3.30c
Philadelphia	2.70c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.14c

PLATES

Baltimore	3.25c
Boston	3.365c
Buffalo	3.40c
Chattanooga	3.35c
Chicago	3.10c
Cincinnati	3.40c
Cleveland ¼ in. and thicker	3.00c
Cleve., 3/16-in.	3.20c
Detroit	3.10c
Detroit, 3/16-in.	3.10c
Houston	3.00c
Los Angeles	3.30c
New York	3.30c
Philadelphia	2.70c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	2.75c to 4.14c

NO. 10 BLUE ANNEALED

Baltimore	3.60c
Boston 3/16-in.	3.915c
Buffalo	3.50c
Chattanooga	3.75c
Chicago	3.35c
Cincinnati	3.45c
Cleveland	3.25c
Detroit	3.35c
Houston	3.90c
Los Angeles	3.85c
New York	3.50c to 3.60c
Portland	3.75c
Philadelphia*†	3.25c
Pittsburgh**	3.25c to 3.35c
San Francisco	3.90c
Seattle	4.00c
St. Louis	3.45c
St. Paul	3.54½c
Tulsa	4.20c to 4.34c

NO. 24 BLACK SHEETS

Baltimore*†	3.75c
Boston	4.85c
Buffalo	4.20c
Chicago	4.05c
Cincinnati	4.05c
Cleveland***	3.75c
Detroit	3.95c
Los Angeles	4.75c
New York	3.65c to 3.90c
Philadelphia*†	3.80c
Pittsburgh**	3.65c to 3.75c
Portland	4.90c
San Francisco	4.90c
Seattle	5.00c
St. Louis	4.25c
St. Paul	3.79c
Tulsa	4.34c

NO. 24 GALVANIZED SHEETS

Baltimore*†	4.50c
Boston	5.60c
Buffalo	4.40c to 4.60c
Chicago (local delivery)	4.60c
Chicago (outside shipment)	4.35c to 4.60c
Cincinnati	4.90c
Cleveland***	4.50c
Detroit	4.60c
Houston	5.40c
Los Angeles	5.20c
Pittsburgh**	4.30c
Philadelphia*†	4.45c
Pittsburgh**	4.40c
Portland	5.50c
San Francisco	5.30c
Seattle	5.50c
St. Louis	4.85c
St. Paul	4.58c
Tulsa	5.10c to 5.35c

BANDS

Baltimore	4.00c
Boston	4.015c to 5.00c
Buffalo	3.65c
Chattanooga	3.45c
Chicago	3.20c
Cincinnati	3.50c
Cleveland	3.25c to 3.65c
Detroit 3/16-in. and lighter	3.30c
Houston	3.65c
Los Angeles	4.30c
New York	3.75c
Philadelphia	3.30c
Pittsburgh	3.25c
Portland	4.00c
San Francisco	3.75c
Seattle	4.00c
St. Paul	3.50c
Tulsa	4.50c to 4.69c

HOOPS

Baltimore	4.00c
Boston	5.50c to 6.00c
Buffalo	4.05c
Chicago	3.75c
Cincinnati	4.05c
Cleveland	3.25c to 3.65c
Detroit, No. 14 and lighter	3.80c
New York	4.25c
Philadelphia	3.55c
Pittsburgh	4.25c
Seattle	5.00c
St. Paul	4.00c

COLD FINISHED STEEL

	Rounds, hexagons	Flats squares
Baltimore (c)	3.50c(a)	4.00c
Boston	3.55c	4.05c
Buffalo	3.95c	4.45c
Chattanooga*	3.85c	4.35c(d)
Chicago	3.60c	4.10c
Cincinnati	3.85c	4.35c
Cleveland	3.65c	4.15c
Detroit	3.85c	4.35c
Los Angeles (a)	4.50c	.....
New York	3.50c	4.00c
Philadelphia*	3.40c	3.90c
Pittsburgh	3.60c	4.10c
Portland (a)	4.50c	.....
San Fran. (a)	4.25c	.....
Seattle (a)	4.75c	.....
St. Paul (a)	3.85c	.....
Tulsa	4.64c	5.14c

(a) Rounds only; (d) Squares only. *Plus quantity differentials.

COLD ROLLED STRIP

Boston, 0.100-inch 500 pounds lots	5.30c
Buffalo	5.85c
Chicago (b)	6.10c
Cincinnati	7.15c
Cleveland (b)	5.95c
Detroit	5.80c
New York	5.05c
Philadelphia (c)	5.05c

(b) Net base, straightening, cutting, boxing 1 ton or more. (c) Plus mill, size and quantity extras.

SWEDISH IRON AND STEEL

New York duty paid

Hollow drill steel	12.50c
Iron bars, round	6.25c
Iron bars, flats and squares	6.50c

††Domestic bars. **Less than 25 sheets. *†50 or more bundles.
***Less 0.15c where more than 10 bundles are ordered at once for delivery at one time.

Pacific Coast

Sales in Northwest Exceed First Quarter 1929—Shapes and Pipe Lead Tonnages

IMPRESSIONS that trade has been dull on the coast are belied by actual figures. Totals for the Northwest show total sales for first quarter exceed the same quarter of 1929 and in California structural sales last week were the second largest of the year. Much business is pending giving promise of even larger sales shortly. Prices show no change from first quarter quotations.

Seattle, April 2.—Notwithstanding unfavorable weather, delay in awarding contracts and complaints of slow business, the Pacific Northwest shows a gain of 6000 tons in the total of steel and iron products placed during the first three months of 1930 compared with the corresponding period in 1929. The following comparative figures include only awards of 100 tons or more as reported weekly by IRON TRADE REVIEW.

	First quarter 1930	First quarter 1929
Reinforcing steel	7,294	3,481
Structural shapes	7,375	5,070
Plates	4,930	2,365
Cast iron pipe	10,653	13,484
	30,252	24,400

In addition to gains in reinforcing and plates, cast iron pipe awards are of unusual interest. Last year of the total of 13,484 tons, French interests took 5645 tons. During the first three months of the current year, cast iron pipe awards included 2000 tons to British interests, 800 tons to a Canadian firm and 425 tons went French pipe. Thus the net American tonnage in the first quarter last year was 7839 and this year's first three months 7428.

Bars, Plates and Shapes

Mill prices are unchanged and steady, merchant bars and shapes at 2.35c, reinforcing at 2.30c and plates at 2.25c.

Local steel mills report unchanged operations. More important specifications are being received and several large jobs are pending. Considerable tonnage in car lots is being booked. This week the Northwest Steel Rolling Mills took 400 tons for the Fraser-Paterson department store and 200 tons for the Pine Realty office building, Seattle. The new Y. M. C. A. building, general contract bids for which are in, will require 400 tons of reinforcing. Unstated tonnages are involved in a 14-story hotel at Yakima, Wash., general contract awarded to A. D. Belanger, and the 18-story Roosevelt hotel, Seattle, general contract to A. W. Quist & Co. F. J. Hugh has the general contract at Portland for the Burgard avenue viaduct, calling for an unstated tonnage of reinforcing.

No important tonnages of plates were awarded this week but there is considerable activity in small tank construction. Sunset Oil Co. is erecting several small oil tanks at Yakima, the Gilmore Oil Co. plans ten small tanks at Seattle, the Shell Oil Co. is constructing additional tankage at Portland and the Seaboard Oil Co. is installing storage at Aberdeen. The Seattle Boiler Works is building three tanks of 20,000 barrels capacity each for the Union Oil Co.'s Alaska station. Tacoma will open bids April 7 for 4228 feet of 52-inch riveted steel pipe, alternate concrete pipe. At the same time Tacoma will receive bids for an intake structure for the municipal steam plant.

The largest fabricating job of the week 460 tons for the government Sand Point, Seattle, airport buildings, was awarded to Hofius Steel & Equipment Co. Dominion Bridge Co. has the contract for furnishing an unstated tonnage of shapes for the Columbia street mental home, New Westminster, B. C.

Finished Materials

The volume of trade with wholesale jobbing houses is showing increased proportions as spring buying develops. March totals registered a larger volume than last year and the outlook is considered more promising. Light plates are moving briskly as many small tanks and boiler jobs are under way. Prices are unchanged.

Pipe Tonnage Is Large

Considerable pipe tonnage remains unplaced although bids are in and awards are due soon. Inquiries continue in large volume and prospects indicate a larger turnover. Edmonton, Alta., has placed 800 tons of cast iron pipe with a manufacturer in Toronto although underbid by American producers. American Cast Iron Pipe Co. was awarded 100 tons of monocast for Calgary, Alta.

Structural Sales Are Large

San Francisco, April 5.—(*By Air Mail*)—Trading in iron and steel products on the Pacific coast this week was confined mostly to structural steel and cast iron pipe, shape bookings being the second heaviest weekly total of the year and cast iron pipe lettings involving close to 3000 tons.

Awards included 1400 tons for a hospital in the Presidio, San Francisco taken by Dyer Bros and 1698 tons of cast iron pipe for Pasadena, Calif., divided between two makers Prices are being fairly well maintained.

Little improvement is noted in demand for foundry pig iron and coke, most foundries continuing to operate on limited schedules. A shipment of 7000 tons of English beehive and by-product coke arrived on the coast this week. The same importer that brought in the coke also has just received 1100 tons of British India foundry iron, about half of which is destined for Los Angeles consumers and the remainder to bay district users. No change in quotations has occurred.

Bars, Plates and Shapes

Concrete bar awards totaled 733 tons, most of which was for projects in the Pacific Northwest. An unnamed interest secured 139 tons of reinforcing bars for paving work in Glenn county Calif. Interest is centered on the opening of bids, this week, for 3500 tons for the Fourth street bridge, Los Angeles. This is the largest project that has come up this year. No award has been made on 350 tons for the Presidio hospital, San Francisco. Bids will open April 23 on 130 tons for a bridge over the Mojave river, Sacramento, Calif. No change in out-of-stock prices is noted, San Francisco prices continuing at 2.30c, base, and Los Angeles quotations at 2.40c. Merchant bar steel is firm at 2.35c, c.i.f., with movement confined to small lots only.

Plate demand is decidedly quiet, the only large inquiry involving 1800 tons for a 20 or 24-inch welded steel pipe line at Crockett, Calif., for the California-Hawaiian Sugar Co., bids on which have been opened. Prices continue general at 2.20c, c.i.f.

Included among the structural shape bookings were 1300 tons for an auditorium in Long Beach, Calif., booked by the Minnesota Steel & Machinery Co., and 350 tons and 100 tons respectively for hangars for the Alameda Airport and Curtis-Wright Co., Alameda, Calif., placed with the Western Iron Works and the Pacific Coast Engineering Co. New inquiries were limited, the largest involving 375 tons for a bridge over the Mojave river for California. Plain shapes remain firm at 2.35c, c.i.f.

Other Finished Material

The United States Pipe & Foundry Co. booked 626 tons of cast iron pipe for Pasadena, 605 tons for Alhambra and 127 tons for San Francisco. C. G. Claussen & Co. took 1072 tons for Pasadena. Total bookings for the week aggregated 2837 tons, bringing the total for the year 30,004 tons compared with 33,282 tons for the corresponding period last year. Bids open April 7 for 617 tons for Santa Ana, Calif. Pending business totals about 2000 tons. No action has yet been taken by the Associated Oil Co., San Francisco, on its inquiry for 900 tons.

Coast Pig Iron Prices

Utah basic	$25.00 to 26.00
Utah foundry	25.00 to 26.00
*German	24.25
*Indian	25.00 to 26.00

*C.i.f. duty paid.

Sheet & Tube Merger Fight Close

Battle of Proxies on Bethlehem's Offer is Continued into Wednesday—Status of Many Votes in Doubt—Eaton Wins 51,000 Shares

YOUNGSTOWN, O., April 8.—Late tonight the outcome of the contest over the proposal of the Bethlehem Steel Co. to take over the Youngstown Sheet & Tube Co. still was in doubt.

At 11:30 p.m., when Frank Purnell, president of Sheet & Tube and chairman of the stockholders' meeting, declared the polls closed and moved that the meeting be adjourned until 11 a.m. Wednesday, which was carried, it became known that Common Pleas Judge Turnbaugh, of Cambridge, O., had decided in favor of the Eaton interests, opposed to the merger, in the matter of 51,000 shares of Sheet & Tube common whose voting status was in doubt.

This block of 51,000 shares had been purchased by Otis & Co., Cleveland investment house of which Cyrus S. Eaton, chief opponent of the merger, is a partner, after March 22, the date when Sheet & Tube directors said stock could not be transferred and voted at today's meeting. An injunction was asked by Otis & Co. to restrain the former owners from voting this stock, and this injunction, it developed, was granted.

Leaders Are On Scene

Leaders of both camps continued on the scene, ready for any emergency. Heading the forces favorable to the merger were James A. Campbell, chairman of Sheet & Tube, Frank Purnell, president; H. G. Dalton, partner of Pickands, Mather & Co., and Eugene G. Grace, president of Bethlehem. Mr. Eaton was leading the fight against the merger.

At the evening session, convening at 8 p.m., L. A. Manchester, general counsel for Sheet & Tube, read the minutes of the various meetings of directors leading up to their decision, March 12, to recommend to stockholders of Sheet & Tube that they accept 1 1/3 shares of Bethlehem common for each share of Sheet & Tube common. It developed that Bethlehem set April 30 as the final date its offer is available. At the evening meeting over 300 stockholders were present.

As Mr. Campbell and Mr. Dalton entered the small auditorium in the First National Bank building here this morning they were applauded. Mr. Campbell called the meeting to order, saying it was a special meeting of stockholders and turned the chair over to Mr. Purnell, who read the formal call of the meeting, saying that the total number of shares entitled to vote was 1,199,112. Because the auditorium was inadequate, the meeting was adjourned until 1 p.m. at the Stambaugh auditorium.

Inspectors Are Named

Nearly 1000 men and women were present and the streets adjoining the auditorium were choked with automobiles when the meeting was resumed. At the request of Walter Watson, vice president of Sheet & Tube, the chair named as inspectors of election three stockholders—E. J. Marshall, of Toledo, O.; E. L. Andrews, of Cleveland; and Osborne Mitchell, of Youngstown. Roy Welsh, secretary of Sheet & Tube, announced the election of the inspectors, who came forward and took the oath.

Immediately Harold T. Clark, of Squire, Sanders & Dempsey, Cleveland, attorneys representing the opponents of the merger, objected to the voting by others of the shares purchased after March 22 by Otis & Co. Mr. Purnell referred the objection to the inspectors. Because of the slowness in counting votes the meeting was then adjourned until 8:00 p.m.

Much of the background of the Bethlehem-Sheet & Tube negotiations and an insight into failure of Sheet & Tube and Inland Steel Co. to consummate their merger several years ago developed in court actions brought at Youngstown and Cleveland by the Eaton interests. An injunction to block the Tuesday stockholders' meeting was denied in the United States district court at Cleveland.

In making a deposition, Mr. Campbell revealed that Mr. Dalton was most active in pressing for a union of Bethlehem and Sheet & Tube. Mr. Campbell said that Mr. Dalton told him the merger had the approval of both Samuel and William G. Mather and that he relied upon the statements of auditors, Mr. Dalton and Mr. Purnell in recommending the sale of Sheet & Tube. He observed that for some time he had been under great pressure to merge both with Bethlehem and Republic Iron & Steel Co. According to Mr. Campbell, a merger with Inland was opposed by Samuel Mather.

On the witness stand at Cleveland, Mr. Eaton said he and his associates are interested in 260,000 shares of Sheet & Tube common, having a market value of about $40,000,000, of which he personally owned about one half. Mr. Eaton stressed the point that he was probably the largest individual stockholder in Sheet & Tube but had not been consulted by Mr. Campbell in the early stages of negotiations with Bethlehem. Mr. Eaton restated his opposition to the merger, that he desired control to remain in northern Ohio instead of Wall Street, as he was doing with the Republic Steel Corp.

According to Mr. Eaton, Pickands, Mather & Co. in 1929 did a business of $35,000 with Inland, $1,498,000 with Republic and $20,955,000 with Sheet & Tube. He said Messrs. Dalton and Campbell had asked him in 1927 to buy into Sheet & Tube to assist the then proposed merger of Sheet & Tube with Inland. Mr. Eaton said he owned 150,000 to 180,000 shares of Inland at the end of 1927, inferring they still were in his possession.

LaGuardia Watchful, but Not Pressing Probe

Washington, April 8.—Representative LaGuardia, of New York, who last week introduced a resolution in the house requesting the attorney general to look into the proposed merger of the Bethlehem Steel Co. and the Youngstown Sheet & Tube Co., on Saturday announced that he would not press his resolution.

This statement was made, he declared, following a conference which he held with Assistant Attorney General John Lord O'Brian, in charge of antitrust cases. He said that he had called Mr. O'Brian's attention to the proposed merger and was informed that the department is watching the matter.

Representative LaGuardia suggested

that if the department of justice fails to take steps to prevent the merger it may be necessary to have a congressional investigation. The department, he stated, can either prevent the merger if it considers it in restraint of trade or it can dissolve it after it has been made. He contends that the merger is being backed by the United States Steel Corp. to form a steel trust.

Most Of Manganese Ore Is Used in Steel

Manganese has become principally an adopted member of the steel family to the exclusion of all other interests according to a report of the bureau of mines, Washington, stating that about 95 per cent of the manganese consumed in the United States is used in the manufacture of steel, the principal base alloys being ferromanganese and spiegeleisen. There is considerable manganese in many varieties of steel, including spring steels, plate steels, structural bar types, rail steels, and various steels used in the manufacture of wheels, tires, axles, armor plate, etc. Formerly manganese steels containing 1 to 1.5 per cent manganese were classed as good-grade bessemer steel, but recently they have been classified as alloy steels and have been put on the market under various trade names. Such steels have excellent tensile strength and ductility, with high resistance to abrasion, and are used extensively in caterpillar shoes, truck wheels, and other appliances where relatively low cost and high quality are required.

Electrochemists Arrange Meeting Program

Discussion of a variety of metals and their treatment and inspection trips to mines and industrial plants will make up the program for the annual spring meeting of the American Electrochemical society to be held at Coronado hotel, St. Louis, May 29-31. The program will open with a session on "Electrodeposition" in charge of Dr. Charles L. Mantell. The afternoon of May 29 will be devoted to visiting plants in and about St. Louis. T. H. Donahue will be in charge of the symposium on "Hydro-Electrometallurgy," on the morning of May 30. Copper, zinc, lead, cadmium, indium, bismuth, and silver will be among the subjects discussed at this session. The afternoon of that day will be reserved for a session on miscellaneous subjects including refractories. The business of the meeting will close May 31, with an all day excursion to the lead mines in the Ozark mountains.

Announces New Films on Vitreous Enameling

Moving picture films showing vitreous enamel operations in the new washer tub enameling plant of the Mullins Mfg. Co., Salem, O., have been prepared by the Ferro Enamel Supply Co., Cleveland, and are available to interested groups. The Ferro Enamel company, manufacturers of porcelain enamel, porcelain enameling equipment, and supplies, also has other films showing continuous furnaces and equipment in stove and kitchenware enameling plants. Arrangements for borrowing these films can be made through E. O. Baldwin, Ferro Enamel Supply Co., Cleveland.

Group Buying Censured By Purchase Agents

The National Association of Purchasing Agents, 11 Park place, New York, has taken a position opposed to buying combinations for organizations and is urging its members to guard against endorsements of promotions of this nature. The association points out that plans are in the making for buyers or consumers in some line to combine their purchasing power and thus dictate conditions and terms of sale. The association states: "Its declaration is important as showing that industrial buyers have no sympathy or leaning toward radical schemes for utilizing collective buying power to control markets, prices and distribution."

Join Metal Trades Body

Membership of the National Metal Trades association is the highest in its history the association reports. The following recently were admitted to membership: Baltimore Enamel Novelty Co., General Elevator Co., Maryland Metal Building Co., and May Oil Burner Corp., Baltimore; Black & Decker Mfg. Co., Towson, Md.; Davis & Hemphill, Elkridge, Md.; Allis-Chalmers Mfg. Co., Pittsburgh Transformer Works, Pittsburgh; Pittsburgh Forgings Co., Corapolis, Pa.; Thomas Spacing Machine Co., Glenshaw, Pa., and Springfield Boiler Co., Springfield, Ill.

Hartford City, Ind., has passed an ordinance excluding scrap yards from its boundaries. Three established scrap firms are planning court action to prevent ouster.

Pig Iron Duty at $1.12½ By Conferees

Washington, April 8.—Conferees on the tariff have agreed to adopt a rate of $1.125 per ton on pig iron, which is the present rate of duty as well as the rate agreed upon by the house. The senate rate was 75c. The conference also adopted the following rates:

Granular ores and sponge iron, $2.25; hammer, roll and mill scale, 75c per ton; chromium content of iron in excess of 0.2 per cent, 3c per pound; ferrochrome over 3 per cent carbon, 2.5c per pound; ferrochrome with less than 3 per cent carbon, 30 per cent. Ferrotungsten rate has been changed from 60c per pound and 40 per cent to 60c per pound and 50 per cent ad valorem on all tungsten contained; silicon aluminum, 5c per pound; cerium metal, $2 per pound; ferrocerium, $2 per pound and 25 per cent ad valorem; and columbium, 40 per cent ad valorem. The conference also has adopted ¾c per pound additional duty on hollow bars and hollow drill steel that is valued over 4c per pound; wire rope, 35 per cent; ingots, ore in the forms not specially provided for or scrap, with over 50 per cent of tungsten, 50 per cent. A rate of 25 per cent on cast iron pipe was agreed upon as well as the following: Reaction chambers, 25 per cent; molders' patterns, of whatever material composed, for the manufacture of castings, 50 per cent; aluminum, aluminum scrap and alloys, 3.5c per pound; and rolled aluminum, 7c.

Safety Group Describes Protective Clothing

Clothing and protective appliances recommended by the National Safety council for use by workers in all lines of work are described in safe practices pamphlet No. 16, "Protective Clothing," prepared by G. E. Burns, safety engineer of the council. The pamphlet recommends the elimination of all loose ends of clothing which might become entangled in machinery and the adoption of clothing which has no exposed opening at the top which might catch hot metal or other substances. The field of safety clothing is completely covered and illustrations show not only this line of protective covering but also shoes, kneeguards, glasses, finger and wrist protectors and many other groups of safety appliances. Copies of the pamphlet can be obtained from the council's headquarters, 20 North Wacker drive, Chicago.

R. C. Allen Heads Iron Ore Association

R. C. Allen, first vice president, Oglebay, Norton & Co., Cleveland, was elected president of the Lake Superior Iron Ore association, April 4, succeeding F. B. Richards, who resigned on his retirement from the M. A. Hanna Co. Other officers elected follow: H. G. Dalton, Pickands, Mather & Co., vice president; S. Livingston Mather, Cleveland-Cliffs Iron Co., vice president; H. S. Stebbins, the Hanna company, treasurer; W. L. Tinker, secretary; R. C. Farquhar, assistant treasurer, and Hazel M. Ronk, assistant secretary.

The constitution was amended to provide for a board of directors, and the board includes Messrs. Allen, Dalton, Mather; G. M. Humphrey, the Hanna company; Donald B. Gillies, Corrigan, McKinney Steel Co.; Patrick Butler, Butler Bros; A. B. Shepherd, Jones & Laughlin Steel Corp.; W. P. Snyder Jr., Shenango Furnace Co., and Clarence B. Randall, Inland Steel Co. The executive committee is composed of Messrs. Allen, Dalton, Mather, Humphrey and Gillies.

Steel Employment Shows Gain for February

Washington, April 8.—Employment and payrolls in the iron and steel industry increased in February. Two hundred and three iron and steel plants reported their January employment as 262,063, increasing in February to 268,327, or 2.4 per cent. Their payrolls increased 10.2 per cent from $7,713,062 to $8,498,445.

Reports from 41 cast iron pipe plants gave their January employment as 10,332, increasing in February to 10,477. Their payrolls advanced from $218,593 to $238,185. Reports from 174 structural ironwork plants show employment dropped from 29,716 in January to 28,879 in February. Their payrolls decreased from $857,457 to $849,464. Employment in 149 machine tool plants dropped from 37,138 to 36,171, while payrolls decreased from $1,124,148 to $1,093,071.

Canadian Auto Output at Half Rate

Toronto, Ont., April 8.—Production of automobiles in Canada during February amounted to 15,548 cars, compared with 10,388 for January and 31,287 for February, 1929. February production shows a gain over January in all classes of vehicles except chassis, which dropped from 3172 units to 2733 units. Of the total February output 10,388 cars were made for sale in Canada, and 5160 for export.

Railroads Spend Nearly Billion Annually

Capital expenditures made by Class I railroads in 1929 for new equipment and additions and betterments to property used in transportation service totaled $853,721,000, according to complete reports by carriers to the Bureau of Railway Economics.

This was the largest amount expended for such purposes in any year since 1926, when capital expenditures totaled $885,086,000. Capital expenditures in 1929 were greater by $177,056,000 than in 1928 and greater by $82,169,000 than in 1927.

Unexpended authorization representing physically uncompleted work were carried over into 1930 from 1929 to the amount of $624,310,000, the largest amount of carryover found on the books of the railroad companies on any Jan. 1 on record.

Of the unexpended authorizations carried over into this year $183,908,000 was for equipment and $440,402,000 for roadway and structures. In both instances, the amounts represent the largest amount of unexpended authorizations from physically uncompleted work ever carried over from one year to another.

Capital expenditures made each year since the close of Federal control in 1920 follow:

1920	$653,267,000
1921	557,036,000
1922	429,273,000
1923	1,059,149,000
1924	874,744,000
1925	748,191,000
1926	885,086,000
1927	771,552,000
1928	676,665,000
1929	853,721,000
Total ten years	$7,508,684,000

Rewarded for Ideas

Out of the 70,000 employes of the General Electric Co., 37 who during 1929 saved money for the company or contributed to its efficiency in an unusual degree have been given awards under the Charles A. Coffin foundation. The awards in each case consist of a certificate of merit and a substantial sum of money. Many made suggestions which mean a definite annual saving to the company. In nine cases these savings have been estimated, and the total figures up to more than $1,250,000 per year.

General American Tank Car Corp., Sharon, Pa., is booked to capacity until July 15.

Cleveland Firm Will Aid Russia Mine Ore

Another American firm has been added to the list of about 20 which have been engaged to aid Russia in expanding its industries. About 50 per cent of the contracts made by the soviet government in its 5-year, billion-dollar industrial plan have been entered into with American firms. Oglebay, Norton & Co., Cleveland, operators of Lake Superior iron ore mines, have closed a contract with the soviet through the Amtorg Trading Corp., New York, representing the soviet government, to give advisory engineering service in developing Russian iron ore mines.

A half dozen engineers will go to Moscow April 28, and a larger group will follow about May 15. A group of Russian representatives visited the iron ore district in the Lake Superior district and were impressed by the mechanical methods of mining and the housing conditions for workers in that district.

Iron ore production in Russia is 5,000,000 to 6,000,000 tons annually, and it is planned to increase this to 15,000,000 to 20,000,000 tons when iron and steel plants have been completed.

Aluminum Output Larger

New aluminum produced in the United States during 1929 amounted to 225,000,000 pounds, valued at $51,864,000, compared with 210,000,000 pounds, valued at $47,899,000, produced in 1928, according to the bureau of mines. The principal producing plant was that at Massena, N. Y., where approximately 42 per cent of the metal made in the United States was produced. Other works are at Niagara Falls, N. Y., Alcoa, Tenn., and Badin, N. C.

Imports of aluminum metal, scrap, and alloy in 1929 were 28 per cent more in quantity than in 1928. Imports of plates, sheets, bars, and the like, in 1929 decreased 16 per cent in quantity, and imports of hollow ware were slightly less than in the previous year. Imports of other manufactures of aluminum increased 15 per cent in value in 1929.

Exports of aluminum ingots, scrap, and alloys in 1929 decreased 74 per cent in quantity. Exports of tubes, moldings, castings and other shapes increased 146 per cent, compared with 1928, and exports of plates, sheets, bars, and the like, increased 23 per cent. The value of table, kitchen, and hospital utensils exported in 1929 increased 10 per cent, and that of other aluminum manufacturers 14 per cent.

Consumers Slow in Closing for Ore

Market Quiet, Following Re-establishment of Prices—Heavy Carryover on 1929 Business—Merger Uncertainties Mentioned

CLEVELAND, April 8.—Less activity is noted in the market for Lake Superior iron ore at this time than in any similar period in the past ten years, in the experience of large producers of the ore. Prices for 1930 were re-established on the same basis as those of 1929, as reported April 1, when the Ford Motor Co. closed with three sellers for 441,000 tons. Following definite action on prices there generally ensues a period of active selling in the open market, but this year considerable hesitancy is evident, not resulting from dissatisfaction with the prices but because of general market conditions.

Following the announcement of the Ford purchase one or two producers declared they had lined up other business, on which 1929 prices would apply but this pertained mainly to long-term contract arrangements. The so-called open market tonnage, where buyers have no definite contract connections and negotiate for their requirements each season, normally amounts to about 4,000,000 tons. It is the opinion of some sellers that not 50 per cent of the open market requirements this year have been covered.

Estimates Not Completed

Many consumers who have term contracts and some of those who have interests in mines have not committed themselves definitely on the amount of ore they will need for 1930. In some instances the 1929 allotments on term contracts have not been taken; the report generally is that there is a heavy carryover from 1929.

Several consumers give uncertainty resulting from merger negotiations and the influence mergers may exert as a reason for postponing action on iron ore contracts. More business in ore is expected to develop in June and July than in April and May, while a few sellers believe the market for ore will see its chief activity in the third quarter.

As near as can be determined from requirements as indicated by some of the principal consumers, shipments this year will be 15 to 20 per cent less than last season, which would result in a total of 53,000,000 to 56,000,000 tons. These estimates are based on the low rate of present consumption, and an increase in iron and steel demand later in the season may strengthen the market.

While no action has been taken on lake vessel rates for ore, it is expected they will be re-established at last year's level making this the sixth consecutive season on that basis. A few of the ore vessels are now carrying coal in the lower lakes, and the shipping season for ore is not likely to open before April 20. Stocks of iron ore at lower lake ports April 1 were 868,916 tons larger than those last year, as shown by the following report for the past from the Lake Superior Iron Ore association:

	Receipts	Shipments	On dock April 1
Buffalo	5,411,640	421,045	16,377
Erie	1,410,016	1,361,988	120,396
Conneaut	9,570,557	9,393,169	1,569,503
Ashtabula	8,872,566	8,748,978	1,490,726
Fairport	2,415,771	2,280,068	346,113
Cleveland	11,148,363	7,745,757	1,032,415
Lorain	3,847,799	1,976,922	119,336
Huron	1,183,879	1,178,698	357,561
Toledo	1,911,981	1,221,940	39,837
Total	45,772,572	34,328,565	5,092,264
Comparative total 1 year previous	36,956,342	28,418,913	4,223,348

Iron Ore Unit Values

	OLD RANGE		MESABI	
	Bessemer	Non-Bessemer	Bessemer	Non-Bessemer
	Cents	Cents	Cents	Cents
1930	9.320	9.029	9.029	8.738
1929	9.320	9.029	9.029	8.738
1928	8.835	8.544	8.544	8.252
1927	8.835	8.544	8.544	8.252
1926	8.835	8.544	8.544	8.252
1925	8.835	8.544	8.544	8.252
1924	11.364	10.680	10.909	10.388
1923	12.818	12.233	12.364	11.942
1922	11.909	11.262	11.454	10.971
1921	12.818	12.233	12.364	11.942
1920	14.636	14.175	14.182	13.883
1919	12.818	12.233	12.364	11.942
1918*				
Oct. 1	13.182	12.621	12.727	12.330
July 1	12.727	12.136	12.273	11.845
Apr. 1	11.909	11.262	11.454	10.971
1917	11.909	11.262	11.454	10.971
1916	9.181	8.349	8.727	8.058
1915	7.909	6.990	7.455	6.699
1914	7.909	6.990	7.445	6.699

*Figures for 1918 established by government.

Foreign Iron Ore Market Is Easier

New York, April 8.—The foreign ore market is livelier. One consumer

Prices of Iron Ore and Pig Iron at Date of Ore Buying Movement, 1901 to 1930

Season	Date buying movement	Old range Bessemer	Mesabi Bessemer	Old range non-Bessemer	Mesabi non-Bessemer	Iron prices, Valley Bessemer	Iron prices, No. 2 Foundry
1930	April 1, 1930	$4.80	$4.65	$4.65	$4.50	$19.00	$18.50
1929	March 22, 1929	4.80	4.65	4.65	4.50	18.50	18.00
1928	April 16, 1928	4.55	4.40	4.40	4.25	17.50	17.25
1927	April 8, 1927	4.55	4.40	4.40	4.25	19.50	18.50
1926	March 17, 1926	4.55	4.40	4.40	4.25	21.00	20.50
1925	April 4, 1925	4.55	4.40	4.40	4.25	22.00	21.00
1924	March 24, 1924	5.65	5.40	4.90	4.75	23.00	22.00
1923	March 24, 1923	6.45	6.20	5.70	5.55	31.00	31.00
1922	June 9, 1922	5.95	5.70	5.20	5.05	25.00	24.00
1921	June 16, 1921	6.45	6.20	5.70	5.55	23.00	22.50
1920	Feb. 2, 1920	7.45	7.20	6.70	6.55	41.00	40.00
1919	April 28, 1919	6.45	6.20	5.70	5.55	27.95	26.75
*1918	Oct. 1, 1918	6.65	6.40	5.90	5.75	35.20	34.00
	July 1, 1918	6.40	6.15	5.65	5.50	35.20	33.00
	April 1, 1918	5.95	5.70	5.20	5.05	35.20	33.00
1917	Nov. 22, 1916	5.95	5.70	5.20	5.05	30.00	26.00
1916	Dec. 7, 1915	4.45	4.20	3.70	3.55	18.50	18.00
1915	April 19, 1915	3.75	3.45	3.00	2.80	13.60	12.75
1914	May 1, 1914	3.75	3.50	3.00	2.85	14.00	13.25
1913	Nov. 19, 1912	4.40	4.15	3.60	3.40	17.25	17.50
1912	March 20, 1912	3.75	3.50	3.00	2.85	14.25	13.25
1911	April 21, 1911	4.50	4.25	3.70	3.50	15.00	13.75
1910	Dec. 24, 1909	5.00	4.75	4.20	4.00	19.00	17.25
1909	May 10, 1909	4.50	4.25	3.70	3.50	14.75	14.25
1908	June 15, 1908	4.50	4.25	3.70	3.50	16.00	15.00
1907	Nov. 5, 1906	5.00	4.75	4.20	4.00	21.50	21.50
1906	Dec. 5, 1905	4.25	4.00	3.70	3.50	17.25	17.25
1905	Feb. 1, 1905	3.75	3.50	3.20	3.00	15.50	16.00
1904	April 15, 1904	3.25	3.00	2.75	2.50	13.35	13.15
1903	March 20, 1903	4.50	4.00	3.60	3.20	21.50	21.65
1902	Feb. 1, 1902	4.25	3.25	3.25	2.75	15.90	15.90
1901	April 15, 1901	4.25	3.25	3.00	2.75	16.15	14.40

*Figures for 1918 established by the government.

has closed on 15 to 20 cargoes of Australian manganiferous ore, 45 to 55 per cent iron and under 10 per cent manganese. A substantial tonnage of North African low phosphorus ore and Spanish North African basic ore, the latter 50 to 60 per cent has been purchased by various domestic consumers.

Foreign manganiferous ore in holding at 11c to 11.50c per unit, alongside docks at Atlantic ports. The tone of this market is strong, some importers asking as high as 12 cents. Trading in North African low phosphorus has been at lower prices. the market now holding at 11.50c to 12c, per unit, alongside Atlantic port docks. Lower prices also have been done on Spanish and North African basic, 50 to 60 per cent, importers doing 10c to 11c, alongside docks. Chrome ore, 48 per cent, is unchanged at $22.50, c.i.f. per net ton, and Newfoundland foundry, 55 per cent, at 9c per unit, alongside docks. Lower prices are noted in manganese ore, Caucasin, 52 to 55 per cent, now quoted at 30c per unit in carload lots, prices not including duty. Indian ore, 48 to 50 per cent, is holding at 30c and Brazilian, 46 to 48 per cent, at 28c. Swedish low phosphorus ore is slightly easier at 11.50c to 12c per unit, alongside Atlantic port docks. Swedish basic, 65 per cent is unchanged at 9.50c to 10.50c

Eastern local ores are scarce. The contract market on foundry and basic 56 to 63 per cent, appears to be around 10c per unit, delivered at eastern Pennsylvania and New Jersey furnaces, although some material still is moving at 9c, a figure contracted for last year.

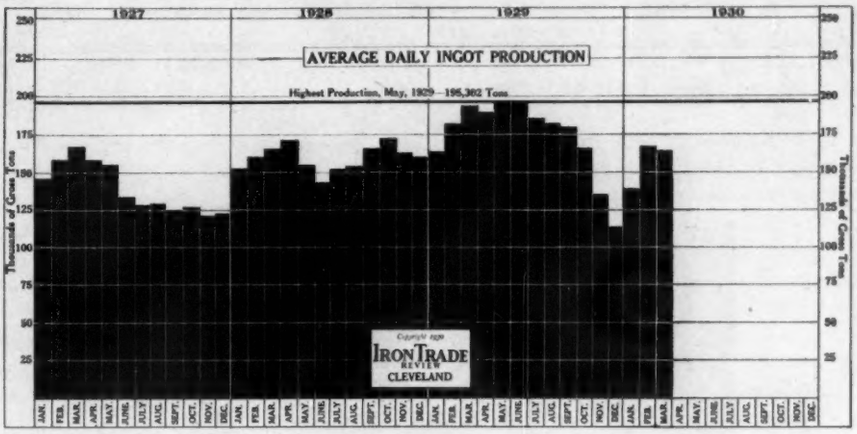
Tennessee Products May Declare Dividend

The Tennessee Products Corp., Nashville, Tenn., producer of charcoal pig iron, ferrophosphorus, etc., reports gross profit from operations in 1929 was $1,209,704. After deducting all charges, including taxes, depletion, depreciation and dividends on 8 per cent preferred stock, the balance applicable to common stock was $358,981.

Earned surplus on Dec. 31, 1929, totaled $1,200,746, compared with $841,765 at the end of 1928. The ratio of current assets to current liabilities is over nine to one. It is expected that directors will declare a dividend on the 207,501 shares of no-par common stock at the meeting in New York, May 6.

A 57,000-horsepower generator has been ordered from General Electric Co. by New York Power & Light Corp., Spier Falls, on the Hudson river, N. Y.

Daily Ingot Rate in March Falls 2.6 Per Cent Under February Level



STEEL ingot production in March reversed the upward trend of January and February, which initiated recovery after the 7-month slump of 1929, and developed a decline of 2 per cent, contrasted with a 4 per cent gain in pig iron.

March, according to the American Iron and Steel institute, had a daily average rate of 164,961 gross tons compared with 169,499 tons on February. Compared with the 194,548-ton rate of March, 1929, last month showed a decline of 16 per cent.

The March total of ingots was 4,288,985 tons an increase over the 4,067,971 tons of February owing to the longer month. In March a year ago ingot production was 5,058,258 tons. March operations engaged 84.12 per cent of capacity, compared with 86.43 per cent in February and 99.2 per cent last March.

First quarter output of steel ingots stands at 12,143,406 tons, or 13 per cent below the 13,874.612 tons of the opening quarter of 1929, which was a record. The daily average rate for the first quarter this year was 157,707 tons, and for last year 180,190 tons.

1930 Year-Book Issued By Electrical Engineers

General information about the activities of the American Institute of Electrical Engineers as well as a complete list of all members as of Jan. 1, 1930 are included in the 1930 *Year-Book of the American Institute of Electrical Engineers*. The membership is listed by individuals and locations.

Steel Ingot Production—1929-1930

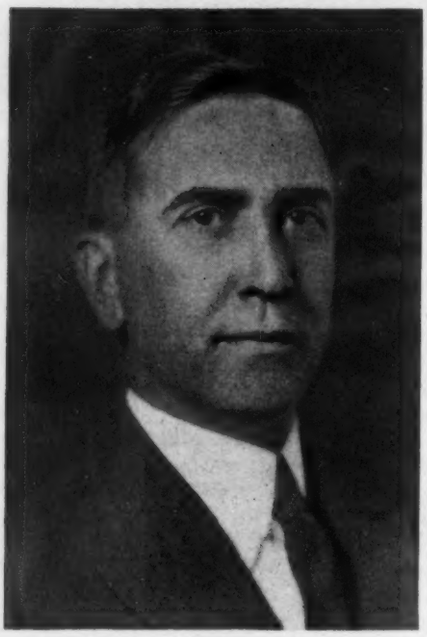
94.51 Per Cent of Industry Reporting

	Gross Tons						
1929	Open-hearth	Bessemer	Monthly output companies reporting	Calculated monthly output all companies	Number of working days	Approximate daily output all companies	Per cent of operation
Jan.	3,694,218	549,616	4,243,834	4,490,354	27	166,309	84.80
Feb.	3,599,224	489,279	4,088,503	4,326,000	24	180,250	91.91
March	4,183,869	596,691	4,780,560	5,058,258	26	194,548	99.20
3 Mos.	11,477,311	1,635,586	13,112,897	13,874,612	77	180,190	91.88
April	4,026,576	640,351	4,666,927	4,938,025	26	189,924	96.84
May	4,276,186	707,484	4,983,670	5,273,167	27	195,302	99.59
June	3,990,798	622,585	4,613,383	4,881,370	25	195,255	99.56
July	3,922,532	649,950	4,572,482	4,838,093	26	186,080	94.88
Aug.	3,988,729	668,023	4,656,752	4,927,258	27	182,491	93.05
Sept.	3,627,639	635,593	4,263,232	4,510,879	25	180,435	92.01
Oct.	3,619,432	644,528	4,263,960	4,511,650	27	167,098	85.21
Nov.	2,797,488	522,672	3,320,160	3,513,025	26	135,116	68.90
Dec.	2,376,775	360,489	2,737,264	2,896,269	25	115,851	59.07
Total	44,103,466	7,087,261	51,190,727	54,164,348	311	174,162	88.81
1930							
Jan.	3,137,002	441,572	3,578,574	3,786,450	27	140,239	71.51
Feb.	3,336,021	508,618	3,844,639	4,067,971	24	169,499	86.43
March	3,513,904	539,616	4,053,520	4,288,985	26	164,961	84.12
3 Mos.	9,986,927	1,489,806	11,476,733	12,143,406	77	157,707	80.42

Figures exclude crucible and electric ingots. Operation percentages for 1929 based on capacity of 60,990,810 gross tons for bessemer and open-hearth steel ingots as of Dec. 31, 1928.

Industrial Men in the Day's News

Charles K. Seymour, New President, Niles-Bement-Pond Co., New York



TWENTY-SEVEN years tenure with one company has furnished him with intimate knowledge of the conduct of its executive affairs.

AFTER graduation as a mechanical engineer, he put on overalls to learn the business from the ground up, and now he occupies the president's chair.

MACHINE tools have been his life's work. Activity in the sales department was preceded by 18 *months in the company's three shops.*

FOR two years more than a quarter century Charles K. Seymour has been actively identified with the machine tool industry. All of those years he has been connected with the same company, which he now heads as president, as noted in IRON TRADE REVIEW of March 20, namely, Niles-Bement-Pond Co., New York, of which he has been treasurer since 1925 and in which capacity he continues. He was elected president to succeed Col. L. S. Horner, resigned, and rose to that position after filling practically every post in the sales department including foreign manager. He will continue also as treasurer of Pratt & Whitney Co., Hartford, Conn., which is owned entirely by Niles-Bement-Pond Co., a position also filled by him since 1925. Niles-Bement-Pond Co. also owns a large interest in General Machinery Corp. and Shepard-Niles Crane & Hoist Corp., in both of which Mr. Seymour is a director.

Graduating from Cornell university with the class of 1903, being granted a degree in mechanical engineering, Mr. Seymour was not averse to donning overalls and jumper in the shops of Niles-Bement-Pond Co. He has been with the company continuously every since. He spent 18 months in the company's shops—six months each at Hartford, Conn., Plainfield, N. J., and Philadelphia—and was then transferred to the New York office where he entered upon sales work to fill with credit practically every position in the sales department. He rapidly earned a reputation as a general utility man and in baseball parlance he "delivered in pinches."

In 1910 Mr. Seymour was appointed manager of the foreign department and in 1915 was made assistant sales manager. At various intervals he has acted as head of the sales department. He was elected secretary of Niles-Bement-Pond Co. and of Pratt & Whitney Co. in 1924, becoming treasurer and vice president also of both companies the following year.

He is a native of Chatham, N. Y., and owns a summer home in that city. His New York residence is at 390 West End avenue and his business headquarters are at 111 Broadway, New York.

EDWARD L. WETSTEIN, sales manager of Michigan Steel Corp., Detroit, since its formation in the fall of 1922, was elected vice president April 4. For 15 years prior to his identification with Michigan Steel Corp. he was associated with American Sheet & Tin Plate Co., Pittsburgh and Detroit. In March, 1929, he was elected a director of Great Lakes Steel Corp.

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Hurlbut W. Smith of Syracuse, N. Y., has been elected a director of the Crucible Steel Co. of America, Pittsburgh.

* * *

R. B. Carter has been elected secretary of H. C. Cook Co., Ansonia, Conn., manufacturer of sheet metal specialties, to succeed the late Frank

H. Bradbury. He was graduated in 1923 from Colgate university and for the past several years has been in the company's production department. He is the eldest son of Chapel S. Carter, president.

* * *

Harold E. White has been elected a director of General Parts Corp., Flint, Mich., to succeed John R. Bodde, resigned.

* * *

George U. Harris of New York has been elected a director of Lima Locomotive Works Inc., Lima, O. He fills the vacancy caused by the resignation in 1929 of his father, John F. Harris.

* * *

Frank A. Hatch was elected a director of Niles-Bement-Pond Co., New York, to take the place made vacant by the retirement of James K. Cullen.

* * *

Wendel Mistler, metallurgist identified with various eastern spring manufacturers, has been appointed chief metallurgist for the Weaver Spring & Bumper Works, Dallas, Tex.

* * *

C. C. Steinhauer was recently appointed Birmingham, Ala., district office and warehouse manager for John A. Roebling's Sons Co., Trenton, N. J.

* * *

L. C. Ledyard Jr., attorney, New York, was elected a director of M. A. Hanna Co., Cleveland, at the recent annual stockholders' meeting. He succeeds C. N. Osborne, who was serving temporarily.

* * *

Joseph W. Meadowcroft, assistant works manager, Edward C. Budd Mfg. Co., Philadelphia, and former president of American Welding society, sailed from New York April 4 for a 6-month trip to Europe.

* * *

George Kidd, chairman of the board of control of British Columbia Electric Co., has been made a member of the board of McLennan, McFeely & Prior Ltd., Vancouver, B. C., wholesale iron, steel and hardware merchants.

* * *

H. W. Noble has been appointed New York sales representative for the Box Crane & Hoist Corp., Philadelphia, to succeed Arthur Appleton, retired. The company's New York offices had been moved from 17 Battery place to 30 Church street.

* * *

Earl D. Stearns, formerly vice president of Fairfield Engineering Co., Marion, O., and at one time president of Stearns Conveyor Co., Cleveland, has been appointed western sales manager of the Robins Conveying Belt Co., New York.

* * *

Louis W. Sumner was recently appointed Michigan representative of Bellis Heat Treating Co., Branford, Conn., with headquarters in the Bank of Michigan building, Detroit, where he will have charge of sales and service and conduct a warehouse.

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Edson T. Hill and not T. Hill, as noted in IRON TRADE REVIEW of March 20, was appointed general sales manager of Detroit Gray Iron Foundry Co., Detroit. He previously had been with the Fisher Body Co., division

EDWARD L. WETSTEIN

of General Motors Corp. for 14 consecutive years, the latter six as purchasing agent.

* * *

Harry E. Penfield, vice president of Standard Screw Co., Chicago, for a number of years, was elected president to succeed Philip B. Gale, who was made chairman of the board. Mr. Penfield became identified with the Standard company 30 years ago.

W. D. Corlett was elected vice president to succeed Mr. Penfield. T. H. Sterling was re-elected secretary-treasurer, and C. A. Post, assistant treasurer.

* * *

Robert Hoierman, formerly field executive of the Memorial Craftsmen of Ohio, was appointed executive secretary of the Ohio Foundries Association Inc., at a board meeting March 26. Mr. Hoierman was born in Bloomington, Ill., in 1890 and was graduated from the University of Illinois, Urbana, Ill., in 1912 as bachelor of science in mechanical engineering. He then served as paymaster in the navy for several years. Following the war he was made assistant secretary of the chamber of commerce at Massillon, O., specializing in welfare work. Later he was connected with the chamber of commerce at Alliance, O. In 1924 he organized the Associated Trades of Commerce at Alliance. This organization is a consolidation of the retail interests of the city.

* * *

Simon Guggenheim was re-elected president and Francis H. Brownell was elected chairman of the board at the April 2 meeting of the directorate of American Smelting & Refining Co., 120 Broadway, New York. Mr. Guggenheim also was re-elected chairman of the executive committee. Mr. Brownell, who has been first vice president and chairman of the finance committee, succeeds Edgar L. Newhouse, who recently resigned after more than 40 years' association with the company. Mr. Newhouse continues as a director.

Bernard M. Baruch, also elected a member of the board, was elected to the executive committee to succeed Lyman Candee.

William Loeb, re-elected vice president, was elected chairman of the pension board, comprising also Francis H. Brownell, Roger W. Straus, Charles Earl, John C. Emison and F. G. Hamrick.

* * *

Groves C. Brown has been appointed director of training for Bethlehem Steel Co., Bethlehem, Pa., to supervise probationary observation circuit and all apprentice training, foreman development and other training activities. He had been associated with the Cambria plant since 1917, six years as assistant in the civil engineering department, six years as chief civil engineer and eight months as management's representative. He also has been an instructor in shop engineering in the Cambria library association.

Mr. Brown was graduated from Cornell university in 1906 with a degree in civil engineering. He was holder of the New York state scholarship and university scholarship on competitive basis, and later was elected to a graduate fellowship in civil engineering, Cornell university, receiving a master's degree.

Following an affiliation with International Waterways commission, he became chief engineer for a company at Sagua La Grande, Cuba. He returned to this country early in 1914, becoming affiliated with the water sup-

ply commission of Pennsylvania. He later was engaged in highway engineering and construction at Portland and Astoria, Oreg., until 1917. He is a member of the American Society of Civil Engineers, American Association of Engineers, American Society for the Advancement of Science and the honorary fraternity, Sigma Xi.

* * *

Charles H. Carroll, formerly forgings buyer, Ford Motor Co., Detroit, has been appointed steel buyer, succeeding C. M. Nelles, who has been made general manager of sales.

* * *

Earl E. Hodil has been appointed chief draftsman for Thomas Spacing Machine Co., Pittsburgh and Glenshaw, Pa., builder of fabricating machinery.

* * *

R. C. Bird, formerly for more than four years with Chain Belt Co., Milwaukee, and for the past two years with D. O. James Mfg. Co., Chicago, transmissions, gears, motors, etc., has been appointed sales engineer for Chicago Steel Foundry Co., Chicago.

* * *

W. George Cook, who for several years has been assistant sales manager of the New Jersey Asbestos Co., has been appointed special railroad representative for the Lukenheimer Co., Cincinnati, with headquarters at Chicago.

* * *

Joseph Thompson, general manager of the Hammond, Ind., plant of Standard Steel Car Co., who has served in practically every department during the past 23 years, has resigned to live in Phoenix, Ariz. He has been general manager for about two years.

* * *

Carl E. Johnson, for the past 10 years associated with the Garden City Sand Co., Chicago, has become connected with the Harbison-Walker Refractories Co., Pittsburgh, in a sales capacity. He will cover the Indiana territory with headquarters at 234 Bankers Trust building, Indianapolis.

* * *

W. B. Kochenderfer, formerly in charge of engineering and sales for Lake Erie Engineering Corp., Buffalo, was recently appointed chief engineer of the hydraulic machinery department, R. D. Wood & Co., Philadelphia and Florence, N. J., builders of medium and heavy hydraulic machinery.

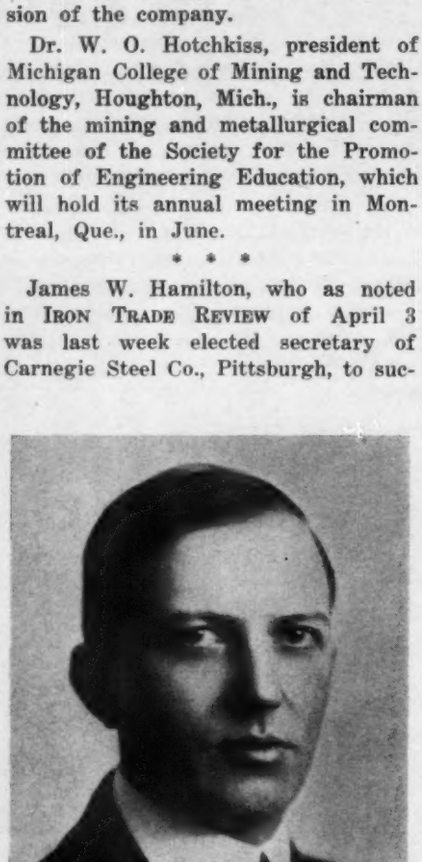
* * *

Lloyd H. Weber, formerly connected with the advertising department of the *Cleveland Press*, Cleveland, and the *Canton Daily News*, Canton, O., has been appointed advertising manager of the Osborn Mfg. Co., Cleveland. Philip F. Smith, formerly advertising manager, has been appointed factory manager of the brush division of the company.

Dr. W. O. Hotchkiss, president of Michigan College of Mining and Technology, Houghton, Mich., is chairman of the mining and metallurgical committee of the Society for the Promotion of Engineering Education, which will hold its annual meeting in Montreal, Que., in June.

* * *

James W. Hamilton, who as noted in IRON TRADE REVIEW of April 3 was last week elected secretary of Carnegie Steel Co., Pittsburgh, to succeed the late James J. Campbell, was born in Pittsburgh and attended public schools there. He later went to Park institute and Kenyon college, Gambier, O., from which he was graduated. His first employment was as law clerk with W. I. Berryman, now trust officer of Union Trust Co. of Pittsburgh, and in 1912 he became legal assistant to L. H. Burnett, now vice president of the Carnegie Steel Co. In 1927, Mr. Hamilton was made assistant secretary. He is a member of Alpha Delta Phi fraternity, is an enthusiastic golfer and is a member of the Shannopin Country, Keystone Athletic and University clubs, Pittsburgh.



JAMES W. HAMILTON

* * *

Clyde E. Williams, formerly chief metallurgist for Columbia Steel Corp., San Francisco, has been appointed assistant director of Battelle Memorial institute, Columbus, O., a foundation devoted to research in metallurgy and fuels and which provides facilities for co-operative research projects in industry. He has been a member of the institute's staff since September, 1929. For many years he was with the United States bureau of mines and is best known for his work on sponge iron, electric furnace cast iron and refractories. At present he also is a member of the subcommittee on metallurgy of Chicago Worlds Fair Centennial celebration.

* * *

G. R. Elliott has been appointed advertising manager for Bridgeport Machine Co., Wichita, Kans., manufacturer of oil field equipment. He was formerly with the Skelly Oil Co., Tulsa, Okla.

* * *

E. W. Duncan has been appointed assistant sales manager of the St. Louis Gas & Coke Corp., St. Louis. Mr. Duncan, a nephew of John Duncan, recently elected president of the company, was formerly associated with Duncan Foundry & Machine Co.

* * *

Mark A. Brown, formerly of Kokomo, Ind., but more recently of Chicago, has been elected chairman of the board of the Globe American Co., the name of the merged Globe Stove & Range Works, Kokomo, and McComb Products Co., McComb, Ill. Other officers are: W. D. Harvey, president; W. S. Toomey, D. B. Tolley and A. J. Stilwell, vice president; E. F. Orem, secretary-treasurer; J. H. Risser, purchasing agent and assistant treasurer; Niota Wood, assistant secretary; Charles R. Curies, assistant sales manager; William Cooper, manager of sales promotion; James P. Thrayers, superintendent of Kokomo plant; and A. P. Scott, superintendent of McComb plant.

* * *

A. W. Daniels, since 1923 general sales manager of American Manganese Steel Co., Chicago, has been elected vice president in charge of sales. He was born in Chicago but started to work at the age of 13. He has had experience in practically every branch of foreign and domestic commerce, manufacturing, accounting, finance, advertising, marketing, sales promotion and executive management. For seven years prior to becoming assistant to the industrial engineer of American Manganese Steel Co., Chicago Heights, Ill., Mr. Daniels traveled extensively as commercial representative. In 1920 he became Chicago office manager for American Manganese Steel Co. and two years later was promoted to central sales manager. One year

later, in 1923, he was made general sales manager.

* * *

Wilfred Sykes has been appointed assistant to the president of Inland Steel Co., in charge of operations with headquarters at the company's Chicago offices, to succeed the late David P. Thompson. Mr. Sykes has been assistant general superintendent of the company's Indiana Harbor works since 1927. He joined the Inland organization in 1923 in charge of new construction work and prior to that was with the Steel & Tube Co. of America for two years and with the Westinghouse Electric & Mfg. Co. for 11 years. He was born in Palmerston North, New Zealand, and is a graduate of the University of Melbourne, Melbourne, Australia.

James H. Walsh has been promoted from the position of general superintendent of the Inland company's Indiana Harbor, Ind., works to works manager of that plant. Mr. Walsh has served as general superintendent since 1927, and was assistant general superintendent for five years before that. Prior to 1922 he had been employed at South Chicago works of the Illinois Steel Co. for 22 years.

Henry R. deHoll succeeds Mr. Walsh as general superintendent. Mr. deHoll has been associated with Inland since 1913, first as superintendent of the coke plants and more recently in charge of blast furnaces and coke plants. He formerly was with the Republic Iron & Steel Co., Birmingham, Ala., and the Tennessee Coal, Iron & Railroad Co., Birmingham.

Frederick M. Gillies replaces Mr. Sykes as assistant general superintendent. Mr. Gillies came to Inland in 1922 as superintendent of the 100-inch plate mill, and has been in charge of several rolling mills at Inland's Indiana Harbor works since 1927. He is a graduate of Cornell university and formerly was in the employ of the Illinois Steel Co.

Other new appointments at Inland's Indiana Harbor works include: C. A. Brassert, superintendent of the 100-inch plate mill; H. W. Johnson, superintendent of blast furnaces; T. F. Plimpton, assistant superintendent of blast furnaces; T. J. Gardner, superintendent of coke plants; and C. L. Corban, assistant superintendent of coke plants.

Union Twist Drill Co., Athol, Mass., has been granted refunds by the bureau of internal revenue for over assessments of income and profits taxes for 1928, $33,619.82; for 1919, $2,343.42; for 1920, $163,100.97; and for 1925, $529.77.

Obituaries

R. H. PALMER, since 1916 foundry manager, Automatic Machine Co., Bridgeport, Conn., and instructor in foundry practice at Worcester Polytechnic institute, died April 1. He had been connected with the foundry industry for more than 50 years as molder, foreman, superintendent and manager of foundries in seven states and in Canada. He started March 4, 1872, as an apprentice molder with Rhode Island Locomotive Works, Providence, R. I., and by 1883 had risen to foundry foreman. He wrote *Foundry Practice*, used as a text book at Worcester Polytechnic institute, and also contributed numerous articles on the same subject to *The Foundry* and other business publications.

* * *

Charles A. Anderson, 68, formerly chairman of the board of the Pittsburgh Valve, Foundry & Construction Co., Pittsburgh, died April 5.

* * *

Lawrence W. McNamee, 70, who retired in 1928 as auditor of Illinois Steel Co., Chicago, and also as president of Gary State bank, Gary, Ind., died recently in Gary.

* * *

Augustus H. Bullard, 63, secretary and treasurer of the Bullard Co., machine tool manufacturer, Bridgeport, Conn., died April 5 at a hospital in that city. Mr. Bullard served for two years as president of the Connecticut Manufacturers' association.

* * *

Joseph D. Harper, 61, manager of the diesel engine division of Fairbanks, Morse & Co., Chicago, with which company he had been connected for more than 30 years, died April 6. Mr. Harper was a native of Indiana and a graduate of Rose Polytechnic institute.

* * *

Frederick Weinhagen, 76, founder of Wisconsin Bridge & Iron Works, Milwaukee, now Wisconsin Bridge & Iron Co., and president for many years, died April 4 at his old home in Hildesheim, Germany, where he had been visiting for the past year. He had resided in Milwaukee since coming to America when 16 years old.

* * *

Robert J. Davidson, Hillburn, N. J., 79, treasurer of the Ramapo Ajax Corp., with which he had been associated 47 years, died April 3 at Daytona Beach, Fla. Mr. Davidson became secretary of the Ramapo Iron Works in 1883 and helped organize the Ramapo Foundry Co., which later merged with the American Brake Shoe & Foundry Co., of which he was a director for many years, also serving on executive and finance committees. He also was a director of Manganese Steel Co., Bronze Metal Co. and vice president of G. W. Garnrick Co.

* * *

George O. Page, 79, who retired five years ago after a 50-year service with American Steel & Wire Co., Cleveland, died recently. As an apprentice in the shops of the Lake Shore & Michigan Southern railroad he learned to build locomotives, and later worked with Billings & Taylor Wire Fence Co. until it was absorbed by American Steel & Wire Co. He served as machinist, foreman, master mechanic and experimental engineer until his retirement from active service in 1925.

* * *

Louis J. Affelder, central division contracting manager since January, 1924, of American Bridge Co., Pittsburgh, died there early this week. He had been with the company and its predecessor for about 39 years, having been assistant engineer for Pittsburgh Bridge Co., at the time the American Bridge Co. was organized, when he became identified with the latter's sales department. From February, 1921 until January, 1924 he was in charge of its marine department, having previously been assistant division contracting manager.

* * *

Henry S. Grove, 82, who died in Philadelphia March 30, was a pioneer of the iron and steel industry in Colorado. He located in that state in 1889 and until October, 1892, was first vice President of Colorado Coal & Iron Co., Denver, predecessor of the present Colorado Fuel & Iron Co. When the coal and iron company merged with Colorado Fuel & Iron Co. in 1892, Mr. Grove returned to Philadelphia, where at 21 years of age he had entered the linseed oil firm of Grove Bros. headed by his father, and where in 1885 he had helped to form the National Linseed Oil Co. In 1903 he became president of William Cramp & Sons Ship & Engine Building Co., holding that post until he retired 12 years ago.

Warns "Carborundum" Is Trade-Mark

The Carborundum Co., Niagara Falls, N. Y., states:

"The Carborundum Co. in its campaign against the growing tendency on the part of authors to treat the word 'Carborundum' as a common or generic noun, announces that the word 'Carborundum' is a trade-mark of this company, registered in the United States and many foreign countries and is applied by it to its range of products: Abrasive, refractory, mechanical and electrical. The Carborundum Co. states that the proper term is silicon carbide and that this is the form that should be used in articles, texts, references, etc., unless a specific Carborundum brand product is referred to. If the word 'Carborundum' is used it should always begin with a capital letter and be put in quotation marks to denote its trade-mark significance."

Cleveland-Cliffs Iron Has Record Year

The Cleveland-Cliffs Iron Co., Cleveland, reports net income for 1929 of $6,046,105, an increase of $1,665,407 compared with 1928. Earnings set a new record, representing an increase for the year of 27.5 per cent. Net was equivalent to $15.12 a share on the common stock compared with $10.95 in 1928. Profit and loss surplus at the end of 1929 totaled $26,608,386, an increase of $900,383. Formation last year of the Cliffs Corp., a holding company for the Cleveland-Cliffs Iron Co., has been of substantial advantage to the Cleveland-Cliffs company, W. G. Mather, president, reports.

Steel Barrels Decline

Cleveland, April 8.—February shipments of steel barrels totaled 418,374 units, or at a production rate of 38.6 per cent of capacity. These figures compare with 439,699 barrels at 40.1 per cent during January, according to the Steel Barrel institute, Cleveland, from reporting members. December, 1929, figures showed 456,340 units shipped, and over the past three months declines have been noted.

Index Levels Lower

Washington, April 8.—February iron and steel production index was 118, compared with 99 for January and 126 for February of last year, taking 1923-1925 at 100, according to the department of commerce.

February nonferrous metals index was 99, compared with 105 for January and 123 for February last year, while production index for automobiles for February was 103, compared with 102 for January and 148 for February last year.

Iron and steel unfilled orders for February was 89, compared with 90 for January and 87 last February.

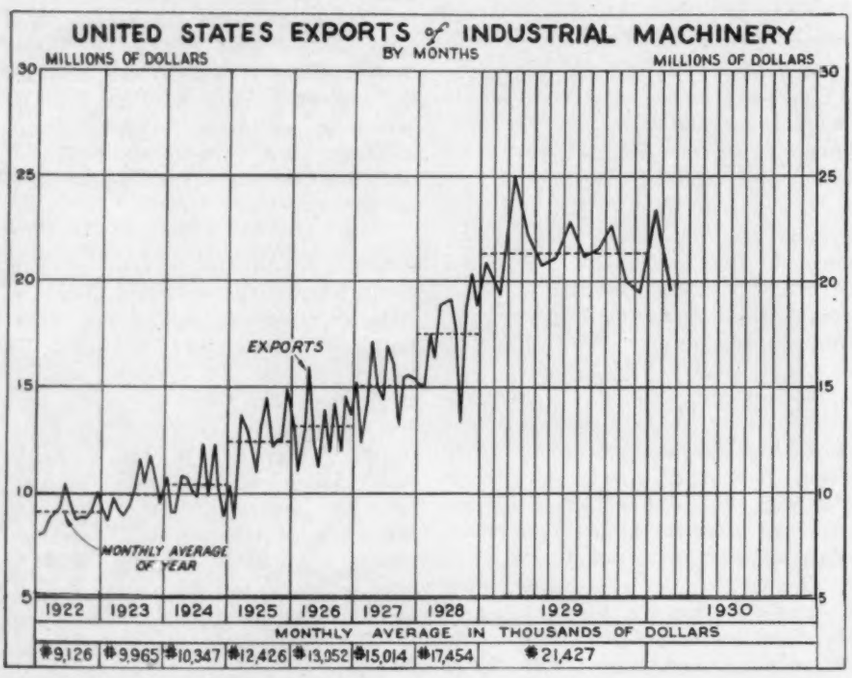
Shipbuilding Is High

According to the annual analysis of *Marine Review*, Cleveland, 145 steel powered vessels of 100 tons or more were under construction in American shipyards during 1929. This increase of more than 57 per cent in number and approximately 70 in gross tonnage over 1928, when 92 vessels were being built, kept American shipyards busier than at any time since the war. Figures for 1928 show 105 vessels and for 1926, 121 under way.

February Prices Lower

Washington, April 8.—February wholesale price index for the iron and steel industry was 94.8 compared with 95.7 for January and 96.9 for February of last year, taking 1926 at 100, according to the department of commerce. Structural steel wholesale price index for February was 91.9 compared with 97 for January and 97 for February of last year.

Industrial Machinery Exports in 1930 Above Record of Last Year



EXPORTS of industrial machinery for the first two months of 1930 reached a total value of $42,926,000, a gain of nearly 9 per cent over the corresponding 1929 period, reports the bureau of foreign and domestic commerce. There were declines in a number of classes in this general group, but the brisk trade in construction machinery, mining, and quarrying machinery, oil well and refinery equipment and metalworking machinery more than offset this loss.

This continued upward tendency on the part of machinery for industry is especially noteworthy and encouraging, in the face of the decline in the total exports trade of the United States, which began in November of last year and has continued through February of this year. Industrial machinery is, in fact, one of the few important items of export which still shows a strong upward tendency, the other notable exceptions being agricultural implements, electrical machinery, and wheat.

Among the metalworking machinery items which accounted for the gains in that group are drilling machines, forging and foundry equipment. Exports of drilling machinery for the two months under review rose from $170,000 to $536,000, forging machinery from $163,000 to $443,000 and foundry equipment from $292,000 to $506,000.

Here and There in Industry

Timely Information Which Records Developments in Various Lines of Productive Enterprise

ARTHUR G. McKEE & CO., engineers, Cleveland, closed the first quarter of 1930 with an unusual quantity of work completed and in progress. Replacement of a blast furnace at Steubenville, O., for the Wheeling Steel corp. was completed in March after ten months' work. A blast furnace on Neville Island, Pittsburgh, for the Davison Coke & Iron Co. was entirely rebuilt in the quarter. A 1000-barrel oil refinery has been completed for the Arrow Oil Co., Canton, O., and a 50 per cent addition is being built to the refinery of the White Star Refining Co., Trenton, Mich. The original plant, built by the McKee company, had capacity of 6000 barrels of crude oil per day. Since the beginning of the year this company has booked 23 contracts of varying size for engineering and construction work at home and abroad. Foreign work includes design and supervision of construction of a large plant for the Soviet government in the Troitzk district of Russia, at Naples and in Japan. Current assets April 1 totaled $749,210,000, with current liabilities of $154,417, leaving net working capital of $594,793, compared with $196,253 Dec. 31, 1929. Estimated net earnings for first quarter are about 15 per cent above those for the same period of 1929. Net earnings after taxes in 1929 were $446,740.

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ELECTRIC MACHINERY MFG. CO., Minneapolis, has moved its Chicago office to 1567 Civic Opera building, 20 North Wacker drive.

* * *

KENTON FOUNDRY CO., Kenton, O., recently formed, has taken over a plant which has been equipped for production of gray iron castings.

* * *

RICHARDS-WILCOX MFG. CO., Aurora, Ill., manufacturer of door hardware, trolleys and special hardware, is observing its fiftieth anniversary this year.

* * *

COLONIAL IRON WORKS, Cleveland, has taken a contract for a slag-crushing plant for the Central furnace of the American Steel & Wire Co., Cleveland. It also has booked an order for conveying machinery for the Warren, O., plant of the Youngstown Pressed Steel Co.

* * *

AMERICAN MONORAIL CO., Cleveland, has opened an office at 3557 West Twenty-second street, Chicago, to handle sales in midwestern territory. Melvin E. Hartzler will be in charge of the new branch.

* * *

DRIVER-HARRIS CO., Harrison, N. J., manufacturer of special alloys, has moved its Chicago office from West Randolph street to 1138 West Washington street, a ground floor location.

* * *

WEBER TRAILER & MFG. CO., Los Angeles, has occupied its new plant, 1100 East Fifth street, one block east of Alameda street. The location is chosen to be close to motor trucking interests for which the company provides service.

* * *

MILWAUKEE WELDED STEEL CORP., 1350 Burnham street, Milwaukee, which was started a year ago, has expanded its operations into a larger plant. It manufactures special equipment for welding and has contract and repair service crews equipped with 15 machines.

* * *

WEAN ENGINEERING CO., Warren, O., in addition to six pack-heating furnaces recently sold to the Gulf States Steel Co., is also supplying that company with an open annealing furnace. The furnaces of this type now in operation or under construction now number 79.

* * *

YOUNG RADIATOR CO., Racine, Wis., has taken an order from the Lycoming Mfg Co., Williamsport, Pa., for marine engine coolers for the Horace Dodge Boat Co., whose motors are being built by the Lycoming Co. These devices are especially designed for marine motors.

* * *

WROUGHT IRON CO. OF AMERICA, Commercial Trust building, Philadelphia, has re-elected Charles Hart, president, and Harvey M. Climer, vice president. J. J. McDermott has been re-elected treasurer and also has been elected secretary, succeeding Frank B. Smith. C. Bradford Fraley was elected a director.

* * *

CANN & SAUL STEEL CO., San Francisco, manufacturer of steel forgings, has re-elected officers and directors. David S. Cann continues as president and general manager: George H. Philson, vice president; Paul E. Simpson, secretary and treasurer; Carl B. Merz, assistant general manager, and F. H. Nagel, manager of sales.

* * *

BELLIS HEAT TREATING CO., Branford, Conn., manufacturer of electric furnace equipment, has opened a sales and service office and warehouse in the Bank of Michigan building, 12244 Dexter boulevard, Detroit, in charge of Louis J. Sumner, Michigan representative. The office will serve Michigan, western Ontario, and probably Toledo, O.

* * *

LINK-BELT CO., Chicago, has appointed three additional agents to handle its line of crawler cranes, shovels, draglines and locomotive cranes. P. L. Tippett, Rhodes building, Atlanta, Ga.; Joseph C. Fiorello Co., Larkin Terminal building, Buffalo; Bacon-Hibbard-Eichman Inc., 917 Central avenue, Cleveland, will handle these machines in the several territories.

* * *

BAY CITY FOUNDRY CO., Bay City, Mich., has been organized to take over the foundry division of the Bay City Foundry & Machine Co. The machine division will be continued under a separate organization. The new foundry company includes Charles T. Clark and Luther G. Beckwith. The machine company will be in charge of Charles B. Curtiss. Mr. Clark will have charge of the office work of the new foundry company and Mr. Beckwith will be in charge of sales. Donald W. Clark will be foundry manager.

* * *

MANSFIELD LOCK WASHER CO., Mansfield, O., manufacturer of automotive spring lock washers, is moving its entire mechanical production equipment to Detroit from its plants at Mansfield. The new plant

is at French road and Grinnell avenue, opposite the municipal airport and close to large automobile plants. The company is a subsidiary of the Reliance Mfg. Co., Massillon, O., manufacturer of spring lock washers for general use. The move is to provide better delivery service to the largest class of users.

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ROME CO. INC., San Francisco, manufacturer of bedsprings, has absorbed the Marshall & Stearns Co., manufacturer of wall beds, and will operate it as a separate division.

* * *

AMERICAN MONORAIL CO., Cleveland, has opened an office at 3557 West Twenty-second street, Chicago, to handle sales in midwest territory. Melvin E. Hartzler is in charge.

* * *

CHAIN BELT CO., Milwaukee, has appointed the Carbon Supply Co., Macon, Ga., its representative for its complete line of chain and transmission equipment.

* * *

IVERSON SPECIALTY CO., subsidiary Iverson Tool Co., Tulsa, Okla., has been appointed Oklahoma distributor for the Hamer Oil Tool Co., Long Beach, Calif.

* * *

PETROLEUM EQUIPMENT CO., Fort Worth, Tex., John R. Long manager, has been appointed Texas distributor for the American Hammered Piston Ring Co., Baltimore.

* * *

UNION SWITCH & SIGNAL CO., Swissvale, Pa., recently installed four upsetting machines for internal displacement work. The installation was necessitated by increased activity in that department.

* * *

A. J. McEWAN & CO., Tulsa, Okla., manufacturers of oil field gas regulating devices, has moved to new office and plant at North Lewis street and the Frisco railroad. A. J. McEwan is president and general manager.

* * *

WILLIAM F. HOAG CO., Eastland, Tex., recently organized to manufacture oil field equipment, has taken over the former Murray Tool Co. plant at Eastland. William F. Hoag, Guthrie, Okla., is president and S. L. Anderson is plant manager.

* * *

BALDWIN-DUCKWORTH CORP. has been formed as a step in the consolidation of the Baldwin Chain & Mfg. Co., Worcester, Mass., and the Duckworth Chain Co., Springfield, Mass. Capital stock of the new corporation is 25,000 shares of no par value. The new corporation already has acquired the assets of the Baldwin company and will shortly acquire those of the Duckworth company.

* * *

BOX CRANE & HOIST CORP., Philadelphia, crane builder, has opened a sales office at 30 Church street, New York, in charge of Harold W. Noble, formerly of the company's main office. Arthur Appleton, formerly representing the company in a sales capacity, has retired from active business.

* * *

HOTH HAY MOWER CO., Pottsville, Iowa, is moving its plant and headquarters to Chippewa Falls, Wis. The Hoth company specializes in the manufacture of large automatic mowers for large farms and estates and has been engaged in business for nearly 18 years.

* * *

AUTOMOTIVE FOUNDRY, LaCrosse, Wis., specializing in castings for marine, industrial and other heavy-duty gasoline engines, has started work on a 1-story addition, 50 x 140 feet, to be equipped exclusively for machining processes, and thus release the present machine shop space for casting purposes. Emil Rasmussen is president and general manager.

* * *

FALK CORP., Milwaukee, is completing preparations for casting the largest gear it has ever attempted to make. The gear is a part of a steel mill drive ordered by the Aluminum Co. of America, and will be 15½ feet in diameter, with a 48-inch base. It will require pouring of 136,000 pounds of steel, the rough weight will be 91,000 pounds and the finished gear will weigh 68,000 pounds.

* * *

MIDWEST PIPING & SUPPLY CO., St. Louis, has purchased a site in Houston, Tex., where it is erecting a branch manufacturing plant for fabrication and assembly of piping for oil refineries and industrial plants. The Houston plant will represent an investment of $250,000 and is expected to be in operation by June 1. Other plants are maintained at Passaic, N. J., and Los Angeles.

* * *

TRANE CO., Second and Cameron streets, LaCrosse, Wis., manufacturing heating specialties, supplies and systems, broke ground April 1 for the first unit, 160 x 120 feet, of a plant at Sixteenth and Bennett streets, to be ready June 1. The new unit will be devoted to the manufacture of extended surface radiation, a comparatively new product. The present plant will be continued in the production of the other items in the Trane line, including valves, fittings, and vapor heating plants, but eventually all manufacturing will be transferred to the new group and the downtown shop remodeled into an administration building.

* * *

McKEE-OLIVER CO., Pittsburgh, iron and steel jobber and mill representative, which a short time ago moved to new and larger quarters at 1326 West Carson street, is making additions to its plant. A building 90 x 110 feet is being erected and a structural and plate yard is being provided. All materials cut will be cold-sawed, a large saw for this purpose recently having been purchased.

* * *

CARBORUNDUM CO., Niagara Falls, N. Y., manufacturer of abrasive and refractory materials, has tripled its Chicago storage space with a lease on the entire second floor of the building at 2626 West Washington boulevard. The company now occupies as its Chicago headquarters the ninth floor of the building at 111 North Canal street. Lease on the larger space, which is served by the Chicago & North Western railroad, has been necessitated by growing business requirements of the Chicago territory.

* * *

INVINCIBLE METAL FURNITURE CO., Manitowoc, Wis., has received the largest single contract in its history from the J. C. Penney Co., New York chain store system, calling for steel office furniture, filing cabinets, lockers, etc., for the standardization of equipment by replacement in its 1300 stores in all parts of the country. The contract will require probably two to three years to execute, and it is believed likely that in view of other substantial orders recently booked and in prospect, an addition to the plant will be built.

Profits Of Continental Shares Rise Sharply

Continental Shares Inc., Cleveland, investment company through which Cyrus S. Eaton and associates control large blocks of shares of independent steel companies, reports a large increase in earnings for the first quarter of 1930 with unrealized profits as of March 31, 1930, in excess of $25,000,000 compared with $8,276,022 on Dec. 31, 1929.

Metal lath department of the Youngstown Pressed Steel Co., Warren, O., is being operated ten hours daily, since its purchase by United States Gypsum Co., Chicago.

Continental Steel Markets Are Dull

French Makers Expect Reaction from Lack of Automobile Orders—Germans Seek Time Extension on Ore Shipments—British Pig Iron, Scrap Weaker

European Headquarters,
IRON TRADE REVIEW,
Caxton House, Westminster, S. W.1

LONDON, April 8.—(*By Cable*)—Further recession is noted in European iron and steel business. IRON TRADE REVIEW'S correspondent in Berlin reports German markets are dull. Pig iron producers are asking suppliers of foreign iron ore to extend contract delivery periods. The report from Brussels is that Belgian markets are stagnant. From Paris comes information that little change is noted in the French markets, but producers expect a reaction from inactivity in other industries, especially automotive.

Sales of pig iron at Middlesbrough are decreasing, though stocks at foundries are low. Exports of pig iron from Middlesbrough increased slightly in March, on a daily basis, compared with February, the total for March being 96ɔ5 tons. The market for East coast hematite is weaker. Demand for scrap is quieter and prices are softer. Improvement is noted in the market for tin plate. Orders for galvanized sheets are fair. Inquiries are being received from South Africa. Stocks at Calcutta are low.

A British company has obtained an export order for 74 forged steel boiler drums. A British firm also obtained an order for tires for 308 locomotives placed by a German interest for a South African contract. Some steelworks in the Barrow district are reopening.

Lower British Iron Fails To Aid Market

BIRMINGHAM, Eng., March 28.—(*European Staff Service*)—The feature of the market is the reduction of 5s ($1.21) in the price of Middlesbrough No. 3 pig iron. The break in price was sooner than expected and some manufacturers say that they are producing below cost in the hope of attracting some business. The price of £3 12s 6d ($17.61) has stood since June last but for some time stocks have been accumulating and merchants did not hesitate to undersell manufacturers' prices. Home sales are expected to improve while some expansion of export trade is also anticipated. This reduction is likely to have a disturbing effect upon the Midland iron trade. The quality of Northampton iron is similar to that of Middlesbrough and there has been keen competition not only on the northeast coast but in Scotland. It will be remembered that some time ago a large order from the Scottish Light Castings association went to a Midland firm, much to the disappointment of Middlesbrough makers. The drop of 5s ($1.21) will make a big difference to this trade although Midland makers will still be able to name their own price as the control exercised by the Central Pig Iron Producers association ceases outside what is called the Black Country zone. Consumers in the Midland area who have been holding off in the hope of a reduction consider their case is strengthened.

Sterling—$4.86

The Buenos Ayres Great Southern railway has placed a contract for 20 locomotives with the Vulcan Foundry Ltd., Lancashire. In connection with

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, April 7	*British* Gross Tons U. K. Ports	*French* Metric Tons Channel Ports	*Belgium and Luxemburg* Metric Tons Channel Ports	*German* Metric Tons Rotterdam or North Sea Port
Export Prices f. o. b. Ship at Port of Dispatch—By Cable	£ s d	£ s d	£ s d	£ s d
PIG IRON				
Foundry No. 3, Silicon 2.50-3.00	$16.44 3 7 6*	$16.31 3 7 0	$16.31 3 7 0	$16.31 3 7 0
Basic-Bessemer	15.95 3 5 6†	15.10 3 2 0	15.10 3 2 0	15.83 3 5 0
Hematite, Phosphorus 0.02-0.05	18.51 3 16 0	24.70 630*	....	17.78 3 13 0
SEMIFINISHED STEEL				
Billets	$29.83 6 2 6	$22.89 4 14 0	$22.89 4 14 0	$22.89 4 14 0
Wire rods	41.40 8 10 0	30.43 6 5 0	30.43 6 5 0	30.43 6 5 0
FINISHED STEEL				
Standard rails	$40.18 8 5 0	$31.65 6 10 0	$31.65 6 10 0	$31.65 6 10 0
Merchant bars	1.74c 8 0 0	1.18c 5 7 6	1.18c 5 7 6	1.18c 5 7 6
Structural shapes	1.68c 7 15 0	1.12c 5 1 6	1.12c 5 1 6	1.12c 5 1 6
Plates, ship, bridge and tank	1.79c 8 5 0	1.44c 6 10 6	1.44c 6 10 6	1.44c 6 10 6
Sheets, black, 24 gage	2.17c 10 0 0	2.26c 10 5 0	2.26c 10 5 0	2.33c 10 12 0
Sheets, galvanized, 24 gage, corrugated	2.47c 11 7 6	2.57c 11 13 9	2.57c 11 13 9	2.97c 13 10 0
Bands and strips	2.17c 10 0 0	1.29c 5 17 6	1.29c 5 17 6	1.29c 5 17 6
Plain wire, base	2.06c 9 10 0	1.44c 6 10 6	1.44c 6 10 6	1.51c 6 17 0
Galvanized wire, base	3.04c 14 0 0	1.82c 8 5 0	1.82c 8 5 0	1.87c 8 10 0
Wire nails, base	2.39c 11 0 0	1.49c 6 15 0	1.49c 6 15 0	1.54c 7 0 0
Tin plate, base box 108 pounds	$ 4.44 0 18 3	....	....	$ 9.01 1 17 0

*Francs

		Francs		Francs		Marks
Domestic Prices at Works or Furnace—Last Reported						
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$16.44 3 7 6	$19.21	490(2)	$17.58	630	$20.30 85
Basic pig iron	15.95 3 5 6	20.58	525(1)	15.07	540	21.73 91
Furnace coke	3.90 0 16 0	6.59	168	6.28	225	5.13 21.50
Billets	29.83 6 2 6	24.30	620	22.60	810	28.89 121
Standard rails	1.79c 8 5 0	1.46c	810	1.73c	1,330	1.51c 140
Merchant bars	1.74c 8 0 0	1.27c	705	1.25c	965	1.52c 141
Shapes	1.83c 8 10 0	1.26c	700	1.22c	940	1.50c 138
Plates, ship, bridge and tank	1.95c 9 0 0	1.46c	810	1.52c	1,170	1.71c 158
Sheets, black, 24-gage	2.28c 10 10 0	2.72c	1,510	2.73c	2,100	2.43c 225
Sheets, galvanized 24 gage, corrugated	2.58c 11 17 6	3.56c	1,975	3.38c	2,600	3.78c 350
Plain wire	2.06c 9 10 0	1.94c	1,075	2.15c	1,650	2.43c 225
Bands and Strips	2.17c 10 0 0	1.44c	800	1.56c	1,200	1.77c 164

*Middlesbrough; †Basic; ‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 15s 0d ($3.65) f. o. b. Ferromanganese £19 6s 0d ($93.99) delivered Atlantic seaboard, duty-paid. German ferromanganese £15 0s 0d ($73.05) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

a large bridge contract for India 10,000 tons of steel are said to be required. This is part of an announcement by the British Steelworks association to the effect that Braithwaite & Co. Ltd., constructional engineers, have been awarded a contract for a bridge over the Irawaddy some nine miles from Mandalay. Braithwaite & Co. have an Indian branch and also a big depot at West Bromwich in South Staffordshire. On the whole, demand for constructional material is poor. Steelworks in Middlesbrough have a certain amount of business to work off, but they would like to see the contracts coming in on a heavier scale. Shipbuilders' specifications are coming in satisfactorily at Middlesbrough.

The Steel association has reaffirmed the prices of heavy steel at £8 7s 6d ($40.69) for angles, £8 10s ($41.29) for joists and £8 17s 6d ($43.10) for ship, bridge and tank plates. This decision disposed of any suggestion that steel manufacturers would be influenced by the reduction of raw materials. They have the satisfaction of knowing that although there is still a wide gap between English and Continental prices establishing of fixed rates for a number of foreign products has been to the advantage of the British market. Slightly higher quotations for strip have been heard of in Birmingham, £5 15s ($27.94) f.o.b. being announced as a minimum. The cost of transport to Birmingham on this material is about £1 2s 6d ($5.46).

In the west of Scotland there are signs of improvement in several branches of trade. There is a considerable expansion in the demand for sheets following the stabilization of prices for 24-gage galvanized corrugated. Makers have booked considerably more business than for some months past and orders for black sheets have also been for larger tonnages. Midland makers of sheets are also better satisfied although export trade is still far from satisfactory. In South Wales trade is still quiet.

Welsh tin plate trade shows signs of recovery. Makers have fairly good order books and delivery of the larger order for Japan taken last week will be made in May and June. In addition there are inquiries from the Far East, Australia and the Continent. Shipments last week were better by 28,000 boxes. Many manufacturers are using foreign tin plate bars but the price of English steel is unchanged at £6 10s ($31.59) a ton, delivered.

German Steel Industry Depressed as Capital Shortage Continues

BERLIN, March 28.—(*European Staff Service*)—Now that the Young plan has been adopted, the outlook is judged more promising in certain quarters. This view, however, is not shared by the heavy industry, which still is in the midst of a progressive depression. The crux of the situation continues to be the shortage of capital, and no fundamental improvement can be anticipated so long as this is not remedied. Owing to these conditions, the iron and steel markets are quiet, and consumers cover only immediate requirements. Although the season is progressing, demand for building purposes still is limited, and railroads also are reluctant buyers. Some wagon-makers have booked better orders, but the automobile industry shows only limited interest, one of the few busy undertakings being the German Ford motor company, which concern has just paid a 10 per cent dividend.

The domestic consumption of rolled products in 1929 aggregated 8,649,434 metric tons, as against 8 865,131 tons in 1928 and 9,857,293 tons in 1913. These figures were composed as follows, in metric tons:

	1929	1928
Merchant bars	2,388,012	2,805,717
Plates and sheets	1,912,441	1,699,053
Permanent way material	1,148,587	905,156
Wire rods	1,053,963	1,101,803
Structural shapes	1,049,052	1,260,513
Pipes	555,813	532,909
Bands	402,478	434,062
Tinplates	139,088	125,888

The formation of syndicates is progressing, and a thin-plate association now has been established comprising all German producers of this product. In this connection it should be mentioned that, with regard to foreign business, an international band export association now has come into existence. Negotiations for prolongation of the Rhenish-Westphalian coal syndicate are not yet concluded, but it is not doubted they will prove successful.

At the August Thyssen-Hutte, of the United Steel Works Co., the construction of a new blast furnace with a capacity of 1200 metric tons per day has been started. This furnace will be one of the largest on the continent. It is stated that it is not intended to lay down old furnaces when this new one commences operations. The Van der Zypen and Wissener Eisenhutten Co. has declared a dividend of 10 per cent for 1929, compared with 9 per cent for the preceding year.

Domestic demand for iron and steel is limited. Semifinished products have remained quiet, while a slight revival has been registered for wire products. The consumption of plates has suffered as a result of unsatisfactory occupation of shipyards. Turnovers of merchant bars have remained limited.

The pig iron market is unsatisfactory, all the more so because the occupation of machine-makers is further giving way. The average daily pig iron output declined from 35,235 metric tons in January to 34,447 tons in February. The German-Polish trade treaty, which now is signed, provides for the annual exportation of 165,000 metric tons of scrap to Poland and the importation of about 40,000 to 50,000 tons of rolled products into Germany.

French Foreign Trade Lower in 1929

Paris, March 28.—(*European Staff Service*)—The French department of commerce has issued provisional foreign trade figures for 1929.

A further drop in exports of iron and steel was registered in 1929. Of the exports of pig iron, 268,298 metric tons went to Belgium and Luxemburg, 99,241 tons to Germany, 79,833 tons to Italy, 55,429 tons to Switzerland, 36,192 tons to Great Britain, the remainder to other countries. Of the total for ferroalloys, 5721 tons were for ferrosilicon and 3168 tons for ferromanganese.

The principal item of exportation consisted of semifinished steel, bars and shapes. The following figures are of interest: blooms and billets were exported to the extent of 454,252.5 metric tons, of which 218,300 tons went to Belgium and Luxemburg, 69,984 tons to Germany, 61,916 tons to Switzerland, 60,013 tons to Great Britain and 39,637 tons to Italy. Exports of merchant steel amounted to 1,623,908 metric tons, of which 447,422 tons went to Germany, 292,194 tons to Great Britain, 245,315 tons to Belgium and Luxemburg 116,961 tons to Switzerland and 86,432 tons to Algeria. The largest proportion of wire rod exports went to Germany with 54,209 tons. With regard to rail exports, 96,906 tons went to Germany and 10,183 tons to Belgium and Luxemburg. Constructional steelwork went mostly to Germany, 61,857 tons, followed by Algeria, 22,116 tons, and Switzerland, 15,764 tons. The country which imported the largest tonnage of cast iron pipes, columns, etc., was Germany, 87,045 tons.

In 1929 the imports of pig iron into France were 401,614 metric tons, as against 403,907 tons in 1928 and 387,399 tons in 1927. Imports of ferroalloys were 159,286 metric tons in 1929, 186,910 tons in 1928 and 283,670 tons in 1927. Imports of other iron and steel products amounted to 282,867 metric tons in 1929, 155,321 tons in 1928 and 106,551 tons in 1927. These figures include scrap imports, which totaled 53,419 metric tons, 61,246 tons and 29,260 tons respectively.

French Coke Output Up

Paris, March 28.—(*European Staff Service*)—Output of coke at French collieries in January was 414,797 metric tons. Imports of coke in January included 288,460 tons from Germany, 83,583 tons from Holland, 65,900 tons from Belgium and 4792 tons from Great Britain. Exports of coke in January were principally to Italy and Switzerland, followed by Belgium and Luxemburg, Spain and other countries. The following table gives January figures, compared with the monthly averages of 1929, 1928, 1927 and 1913, in metric tons:

Mon. ave.	Production	Imports	Exports
1913	335,620	255,835	17,085
1927	339,015	395,580	38,430
1928	366,660	447,330	34,810
1929	397,435	453,720	39,070
1930			
Jan.	414,797	442,754	37,473

Thomas Young, the English physicist, introduced the term "modulus of elasticity" in 1807.

CONSTRUCTION *and* ENTERPRISE

Concise, Timely Business Building Opportunities from Field of Industry

North Atlantic

HARTFORD, CONN. — Superior Spring & Mfg. Co. Inc., 373 Washington street, is receiving bids for a 2-story, 60 x 130-foot plant addition, revised plans having been drawn. C. Shultz, 118 Sheffield avenue, is engineer. (Noted Feb. 20.)

NEW LONDON, CONN.—City, care G. E. Waters, engineer, plans pump house extension and waterworks alterations.

WEST HAVEN, CONN.—Hygenic Ice Corp., 881 State street, New Haven, Conn., will build a 1-story ice-manufacturing plant here which with equipment is expected to cost about $50,000.

BALTIMORE—Doyle Aero Corp. plant, a 2-story building, was recently damaged by fire. Building is at 3100 Elm avenue.

ATHOL, MASS.—N. D. Cass, 67 Canal street, toy manufacturer, has plans for a 3-story manufacturing plant on Canal street.

BOSTON—Bethlehem Shipbuilding Corp., 100 Milk street, is receiving bids for 1 and 2-story boat and rivet-shop building at Fore river plant, Quincy works. Cost is estimated at about $40,000.

EVERETT, MASS. — Plant of the Everett Smelting Co., 132 Spring street, recently was damaged by fire.

WESTFIELD, MASS.—Commission of finance, city hall, is receiving bids for a 3-story boys' training school here to include manual training shops.

LINDEN, N. J.—Commercial Steel Equipment Co., 1024 Elizabeth avenue, manufacturer of office fixtures, is having plans prepared by A. J. Silberstein, 60 Park place, Newark, N. J., for a 1-story plant.

NEWARK, N. J.—National Washer Co., Pennington street, has awarded contract to Shore Construction Co., 94 Christie street, for a 4-story, 75 x 105-foot plant addition and a 36 x 50-foot new unit. Monks & Johnson, 99 Chauncey street, are architects and engineers.

BROOKLYN, N. Y.—Public Fireproof Sash & Door Corp., 319 Van Sinderen avenue, manufacturer, was damaged by fire recently.

BUFFALO—Fetter Steel Barrel Co., Lansing street, manufacturer of steel containers, will begin construction of a plant building, 105 x 180 feet, at Hertel and Elmwood avenues.

NEW YORK—Metal Cast Products Co., 1696 Boston road, maker of molds, castings and metal toys, recently suffered fire damage to stock and equipment.

NEW YORK—Standard Concrete Steel Co., manufacturer, 250 Eighth avenue, plans a warehouse and garage to be two stories, 75 x 100 feet.

NEW YORK—Curtiss-Wright Export Corp., 27 West Fifty-seventh street, advises it has let contract to Standard Erecting Corp., 551 Fifth avenue, for an airplane-manufacture development at Los Cerrillos airport, Santiago, Chile. (Noted March 27.)

BLACK LICK, PA.—Atterbury Corp. has started work on a steel plant to cost approximately $300,000 for the manufacture of cast and forged steel, valves and fixtures for the oil fields. Several abandoned buildings have been reconditioned here and other units are being constructed. Edward T. Ryan, 732 Bayridge avenue, Pittsburgh, is secretary and treasurer.

DANVILLE, PA.—Department of property and supplies, State house, Harrisburg, Pa., will receive bids until April 16 for equipment at state hospital here to include electric generator, steam turbine unit and coal-handling equipment.

DEVON, PA.—Pennsylvania Fireworks Display Co.'s entire plant was destroyed by explosion recently. Other plants in vicinity, including plant of Benjamin T. Dentner, were damaged.

ERIE, PA.—Erie Foundry Co., West Twelfth street, maker of automotive castings and equipment, has awarded contract to H. Rommerdale Construction Co. for a 1-story, 62 x 80-foot addition costing approximately $20,000.

GLASSPORT, PA.—Copperweld Steel Co. is completing a research laboratory building costing approximately $50,000 for wire-research facilities.

PHILADELPHIA—Dixon Valve & Coupling Co., Emerald and Hagert streets, has awarded contract to Bennett-McLaughlin Co., 3434 Sansom street, for erection of a machine shop on Palethorp street, north of Columbia avenue.

TITUSVILLE, PA. — Titusville Iron Works Inc. plans electric power equipment in connection with 1 and 2-story plant addition.

WARREN, PA.—Pennsylvania Furnace & Iron Co., Pine street, recently awarded contract for a shop building, 1-story, 68 x 200 feet.

WEST NEWTON, PA.—United States Radiator Corp., manufacturer of steam and hot-water radiators, First National Bank building, Detroit, is said to plan plant expansion here following recent leasing of a nearby site. Corporation is contemplating machine shop and storage room enlargement.

PROVIDENCE, R. I.—New England Auto Body & Radiator Co., 56 Federal street, recently awarded contract for alterations to radiator shop.

East Central

CHICAGO—Empire Body Building Corp., 624 West Twenty-sixth street, manufacturer of auto bodies, has leased a 3-story plant building at 2601 Archer avenue.

CHICAGO—Commonwealth Edison Co., 72 West Adams street, has been granted a building permit for a 3-story, 44 x 121-foot shop, to be constructed at 4231 Madison street.

CHICAGO—H. W. Caldwell & Son Co., 1700 South Western avenue, manufacturer of conveying machinery and a subsidiary of Link-Belt Co., has been granted a building permit for a 1-story, 20 x 94-foot plant costing approximately $4500.

CHICAGO—American Can Co., 120 Broadway, New York, is reported having private plans for a plant building addition on present manufacturing site at 5921 South Canal street. Plans are not expected to mature for some time.

CHICAGO—Teletype Corp., 1400 Wrightwood avenue, manufacturer of telegraph transcribing equipment, recently awarded contract for a 1-story plant addition about 40 x 300 feet.

CHICAGO—Continental Can Co., 4633 West Grand avenue, has been granted a permit for the erection of a 3-story, 84 x 140-foot manufacturing plant at 4647 Grand avenue, to cost $180,000. Fracisco & Jacobus, 360 North Michigan avenue, are architects.

CHICAGO—Joslyn Mfg. & Supply Co., manufacturer of knobs and tubes, 133 West Washington street, is taking bids for a 1-story shop at Thirty-seventh and Morgan streets. Abel Howe Co., 53 West Jackson boulevard, is engineer.

CHICAGO—Manufacturers' Junction railroad,

(*Continued on Page* 123)

Machinery

Continued Hesitancy Toward Closing Noted —Dullness Features Middle West Markets— Railroads Inquire for a Few Tools

DESPITE numerous outstanding inquiries, continued hesitancy toward closing is met in most districts, awards being scattered and largely for light equipment. One report states that first quarter business was the lightest for any similar period since 1921. Dullness predominates in the Detroit, Cleveland and Chicago districts but no anxiety or alarm over the situation is evident, opinion being that business is due to come to life at any moment and when it does it will not catch dealers unprepared as stocks are being built up to meet any sudden demand. Two railroads in the East are doing light buying while three roads in the Chicago district are inquiring for miscellaneous equipment. New business from steel companies is light, according to a report from Pittsburgh.

New York, April 8.—The slight gain noted in machine tool buying in March appears to be maintained, with demand coming out from diversified sources. Recent inquiries include about 15 machine tools for the Schenectady, N. Y., plant of the General Electric Co., among which are universal turret lathes, shapers, standard lathes and tool room grinders. The Delaware & Hudson railroad is inquiring for six or eight miscellaneous machine tools, while the Delaware, Lackawanna & Western, originally in the market for approximately 20 items of equipment, has closed on a sensitive drill and a few chain hoists and has withdrawn from the market on the remaining items. Fabricated shops have been buying actively, although no large lists have been involved. Crane demand is light.

Worcester, Mass., April 8.—The machinery market still is belabored by the inactivity of general business. Some quarters report plenty of inquiry but no orders and what business is outstanding is spotty and in small volume. Reed-Prentice Corp. reports its circular saw and drum lathe holding production at last year's levels but machine tools are weak. Wheels are slow. Most manufacturers are looking to the automobile industry to bring business back.

Pittsburgh, April 8.—Hesitancy still is noted in closing on a number of inquiries for machine tools although general activity is improved over the dullness prevailing earlier in the year. Inquiry is steady but awards involve only a few tools at a time and large lists are lacking in both orders and new business. Westinghouse Electric & Mfg. Co. has several tools pending. Railroad orders still are light and little new business is appearing from steel companies. The volume of pending work indicates improved activity for April and May.

Cleveland, April 8.—Machinery business here appears to be fast going to the dogs, although dealers are not particularly alarmed over the situation, accepting it as a natural course following heavy sales last year and the strenuous market readjustment. Sales are few and inquiries are scattered and of small size. Awards the past week were inconsequential. Through Detroit offices some houses are closing on a few automotive items, including tools for the Austin plant at Butler, Pa., and others. A price increase of 5 per cent on one line of cylindrical grinders is in the offing. Machine tool production is going largely to dealers' stocks in anticipation of a sudden coming to life of buying. One dealer reports April sales so far only 10 per cent of last year's total for the same period.

Chicago, April 8.—Orders in the machine tool market in this district during the week were almost entirely for light equipment. Despite numerous outstanding inquiries, a marked hesitancy toward closing for machine tools is noted. Some statements are that the first quarter was the lightest with respect to actual business closed of any similar period since 1921. The view here is that the dullness is more pronounced now in the Chicago and Detroit districts than at any other market centers. Sales included a number of drills, and few small lathes and milling machines, as well as miscellaneous shop equipment and used tools. Chicago & North Western railroad is asking bids on a No. 5 press, 50-inch upright drill and a 30-inch punch press. Rock Island has added some wood-working tools to its list. Chicago Burlington & Quincy will buy additional welding equipment. Most of the machine tool builders are fairly busy, but much of the production now is going into stock. It is understood that a number of the farm implement companies will be in the market later in the season.

Great Gains Are Made in Man-Hour Productivity

Man-hour productivity in the iron and steel industry increased 163 per cent from 1899 to 1927, according to a survey by the bureau of labor statistics. The bureau recently carried forward its statistics of productivity in 11 manufacturing industries by means of the employment and production figures from the 1927 census of manufactures. The new figures show that between 1925 and 1927 there was an increase in man-hour productivity in nine of the 11 industries, ranging from 1 per cent for the iron and steel industry to 12 per cent for the cement manufacturing industry.

The automobile industry suffered a slight decrease in 1927 as compared with 1925. Compared with 1914, however, the man-hour productivity in all of the 11 industries showed a decided decrease, the greatest changes taking place in the automobile and rubber tire industries, in which the increases reached 178 and 292 per cent, respectively. The gain for iron and steel was 55 per cent. Following are the index numbers of man-hour productivity of labor in the iron and steel industry:

Year	Industry as a whole	Blast furnaces	Steel works and rolling mills
1899	59	44	63
1904	69	59	70
1909	100	80	104
1914	100	100	100
1919	100	85	96
1921	87	106	85
1923	131	149	126
1924	130	156	123
1925	153	196	143
1926	157	204	149
1927	155	203	146

Harvard Award to Revere

An advertisement of Revere Copper & Brass Inc., entitled "The Smoke Marks Paul Revere's Foundry," received the Harvard award for the advertisement published in 1929 most distinguished for its effective use of typography.

More than 12,000 advertisements of prominent companies were entered in this competition, which is conducted every year by the graduate school of business administration of Harvard university. The prize winning advertisement was the second ever published by Revere Copper & Brass Inc., a consolidation of six old and well known companies in the copper and brass field. Its national advertising campaign was begun only last November, when the company's name was changed from Republic Brass Corp.

This advertisement was one of a series of six which trace the company's history from the time of Paul Revere, noted patriot and founder of the copper and brass industry in America, to the present day Revere organization.

The fourth annual welding conference, sponsored by engineering and trades department, North Texas Agricultural college, Arlington, Tex., was held March 13-14 with a large attendance. D. H. Deyoe, General Electric Co., Schenectady, N. Y., and C. O. Carter, Linde Air Products Co., New York, were among speakers.

Construction and Enterprise

(*Continued from Page* 121)

11 South LaSalle street, a subsidiary of the Western Electric Co., will treble warehouse space by erection of a freight house, 52 x 198 feet, having 10,000,000 square feet fo storage space, on Cicero avenue.

McHENRY, ILL.—Construction shop of Henry Boat Co. was recently damaged by fire to extent of $50,000 loss.

MOLINE, ILL.—Burgess Parr Co., operating a foundry and manufacturer of scientific apparatus, is erecting a pattern and flask-storage building.

SPRINGFIELD, ILL.—University of Illinois, care Dr. W. L. Nobell, is having plans drawn for a 5 and 6-story laboratory building to cost approximately $1,500,000. Granger & Bollenbacher, 333 North Michigan avenue, are architects.

GRIFFITH, IND.—Keen Foundry Co., Louis F. Keen, president, recently purchased a 4-acre tract here, formerly owned by the Griffith Steel Co., which will be improved with a new building and alterations to be made this spring estimated to cost about $50,000. The company advises that building will be a fireproof foundry, machine and pattern shop.

INDIANAPOLIS—Hollenbeck Wire Works, 2251 Massachusetts avenue, suffered fire damage in main plant recently. Loss was estimated at $1500.

MUNCIE, IND.—Board of directors, Indiana State normal school is said to plan a power plant at school here.

CHARLEVOIX, MICH. — City, care Arthur Bergeon, mayor, is making a preliminary survey for a power plant addition to cost about $80,000.

NELSONVILLE, O.—Industrial leaders recently meeting here from Columbus and surrounding valley communities organized the Hocking Valley Inc., a profit sharing group intended to draw new industries into this region.

NEWARK, O.—Superior Welding & Machine Co., 58 West Main street, is reported planning purchase of some machine shop equipment. C. H. Harris is manager.

NEW LONDON, O.—Plant formerly owned by the Lancaster Iron Works here and which has been idle for several months, may be reopened if negotiations materialize for a company manufacturing brick-casting machinery to locate here.

TOLEDO, O.—Loading docks, automobiles and equipment belonging to Willys-Overland Co. were recently damaged by fire in a loss estimated at $280,000.

WAYNESBURG, O. — National Fireproofing Co., Fulton building, Pittsburgh, manufacturer of conduits, grain bins and hollow tile, will receive bids about April 18 for rebuilding a 1-story, 100 x 150-foot plant damaged by fire. (Noted March 27.)

WESTERVILLE, O.—Bennett Mfg. Co., manufacturer of implements, harvesters and farm machinery, plant of which was damaged by fire several months ago, is rebuilding.

MILWAUKEE—E. D. Coddington Mfg. Co., 5024 Thirty-seventh street advises it breaks ground April 10 for a 1-story, 60 x 100-foot, manufacturing plant addition, specializing in metal building materials and supplies.

MILWAUKEE—Western Metal Specialty Co., 1251 Thirtieth street, manufacturer of automotive and industrial sheet metal products, advises through J. J. Goetz, president, that operations were started recently on a 50 x 100-foot plant addition.

MILWAUKEE—Donahue-Stratton Co., 85 East Michigan street, operating the Chicago & Northwestern Kinnickinnic elevator for the handling of grain, announces that work will begin April 15 on 48 additional units. The work costing $700,000 will require a large quantity of conveying and handling equipment, motors and enlargement of power supply. W. J. Towne, 400 West Madison street, Chicago, is chief engineer.

Southern States

SYLACAUGA, ALA.—Eagle Iron Works is erecting a pattern shop here.

STAR CITY, ARK.—City, care waterworks improvement board, will receive bids for a diesel engine, motor and pumps.

NORTONVILLE, KY.—Fire damaged engine room at the mine here of Norton Coal Mining Co., Comer boulevard, Birmingham, Ala., recently, loss approximating $25,000.

MONROE, LA.—L. A. Ellis has been awarded contract by Ouachita parish police jury for barn and shop building, 60 x 100 feet, to include machine shop for repair of road machinery.

NEW ORLEANS—Water and sewerage board, 526 Carondelet avenue, will receive bids until May 21 for pumping station equipment to include motor generators, transformers and auxiliary equipment. A. G. Moffett is secretary in charge of receiving bids.

SHAWNEE, OKLA.—R. F. Electrical Mfg. Co., care O. C. Jones, manager, Augusta, Kans., recently acquired site for a plant here to manufacture electrical products. Cost of building with equipment is reported at about $35,000.

TULSA, OKLA.—Wheatley Bros. Brass & Metal Works, 24 North Owasso street, has started construction of a structural steel shop building, 83 x 160 feet, on Sand Springs road. DeWitt & Howard have been awarded the general contract. Advice from the company states cost at $50,000 without equipment.

LUBBOCK, TEX. — Chamber of Commerce is receiving bids for hangars on a 640-acre tract for municipal airport recently acquired through proceeds of a bond issue.

SAN ANGELO, TEX.—Gulf, Colorado & Santa Fe railroad has purchased a 600-acre site here for extensive railroad yards and roundhouse. Chief engineer is F. Merritt, Santa Fe building, Twenty-fifth and B streets.

BREMO BLUFF, VA.—Virginia Public Service Co., care A. W. Higgins, president, Charlottsville, Va., will build a steam-generating plant here to cost $3,000,000.

HOPEWELL, VA.—Atmospheric Nitrogen Corp., subsidiary of Allied Chemical & Die Corp., 61 Broadway, New York, will construct another unit to its plant here at a reported cost of approximately $20,000,000. Units to be constructed will include ammonia, nitrate, gas and electric plants.

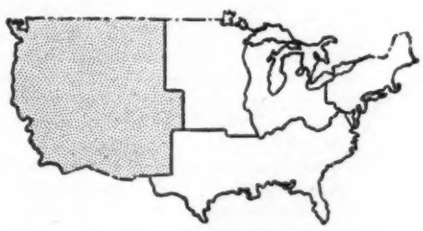
West Central

ATCHISON, KANS.—Locomotive Finished Material Co. is constructing a steel foundry, 135 x 400 feet, for the production of steel castings. A 2½-ton electric furnace and other equipment will be installed. H. E. Muchnic is president and general manager.

ATCHISON, KANS.—Atchison Specialty & Mfg. Co. is constructing a new building, 105 x 300 feet, to be used as a foundry and machine shop. The foundry is being equipped under Charles Cooper, works manager, for the production of gray iron, brass and aluminum castings. George E. Cooke is president.

DULUTH—Minnesota Power & Light Co., 30 West Superior street, a subsidiary of the American Power & Light Co., will build a steam electric generating plant on the St. Louis river here. The entire project involves the expenditure of about $18,000,000.

OMAHA, NEBR.—Union Pacific railroad, 1416 Dodge street, care H. C. Mann, chief engineer, plans construction of repair shops and garage estimated to cost $1,000,000.



Western States

ALAMEDA, CALIF. — Curtiss-Wright Airports Corp. is reported to plan building a 108 x 120-foot hangar and headquarters here at airport which plans to include mechanic's shops and quarters.

DENVER—Banner Iron & Steel Work Co., 1520 Blake street, is said to plan construction of a machine shop at 3430 Brighton boulevard estimated to cost about $4500.

DENVER—Bureau of reclamation here will reveive bids until April 25 for high pressure gates with hydraulic hoists, conduit linings

and transitions, elbows and bolts for the sluice irrigation and power outlets at Owyhee dam project, Oregon.

LA JUNTA, COLO.—Town has plans in progress through Douglass & Thwaits, engineers, 232 Continental Oil building, Denver, for a pumping plant.

PUEBLO, COLO.—State board of corrections, care Frank S. Hoag, secretary, will receive bids until April 10 for furnishing and installing a 350-horsepower water tube boiler to cost about $20,000.

EUGENE, OREG.—Southern Pacific railway, 65 Market street, San Francisco, plans expenditure of $100,000 for equipment to be installed in shops here. Included will be a large crane, a 600-ton wheel press, a 33-inch draw-cut shaper, a 24-inch steel-cutting lathe, radial drill press steam hammer, large air compressor, a special driving-box boring mill, and other lathes.

SALT LAKE CITY, UTAH.—American Smelting & Refining Co. is said to contemplate installation of electrical mining hoist and equipment in the Frisco Lulu property. Plans are private.

ABERDEEN, WASH.—Contract for a building to cost approximately $12,000 to be built here for Superior Parts Co. and Olson Machine Shop has been awarded.

SEATTLE—George Williams has awarded contract to H. D. Stewart, American Bank building, for a 60 x 80-foot machine shop to be erected at 501 South Twelfth avenue.

Canada

NEW WESTMINSTER, B. C.—Adkinson & Dill Ltd., 319 Pender street, Vancouver, B. C., has been awarded contract for a power house to cost $115,000 to be erected for the Mental hospital here.

RICHMOND, B. C.—Airland Mfg. Co. Ltd. proposes to start work at once on a 100 x 110-foot assembly plant here to cost about $50,000.

VANCOUVER, B. C.—Air-Land Mfg. Co., care W. E. Anderson, is constructing a plant near here for the assembling of seaplanes.

WINNIPEG, MAN.—McDonald Bros. Aircraft Ltd., 50 Robinson street, advises through Grant McDonald, president and manager, that company will manufacture seaplane floats and will engage in design and construction of hangars. Equipment will comprise power shears, power brake, rotary steel assembly jigs, air compressor, tools for pneumatic riveting and heat-treating equipment. (Noted April 3.)

ANNAPOLIS ROYAL, N. S.—Town council, care F. W. Harris, clerk, contemplates purchase of equipment for electric plant here to cost $18,000.

CHATHAM, ONT.—Dominion Lock Joint Pipe Co., Toronto, Ont., will establish a temporary plant here for the manufacture of pipe to be used in the construction of a trunk sewer at South Chatham, Ont.

NIAGARA FALLS, ONT.—Niagara Falls Water commission, Queen street, will call for bids soon for a power house to cost $500,000 and a filtration plant to cost $500,000 in Queen Victoria park. H. G. Acres & Co. Ltd., Ferry street, is architect.

SANDWICH, ONT.—Caldwell Sand & Gravel Co. Ltd., 228 Sandwich street, Windsor, Ont., will ask for bids soon for a 1-story, 44 x 100-foot machine shop to be built on Russell street, here, at a cost of $60,000.

TORONTO, ONT.—Hamilton Gear & Machine Co. Ltd., 76 Van Horne street, has awarded contract to Wells & Grey Ltd., Confederation Life building, for a 1-story machine shop addition 45 x 120 feet, estimated to cost $20,000. Harkness & Hertzberg, Confederation Life building, are engineers. Advice from the company states no equipment needed.

WALKERVILLE, ONT.—Canadian Bridge Co. advises it will call for bids at an early date for a 1-story plant addition, 240 x 310 feet.

GATINEAU, QUE.—Canadian International Paper Co. has commenced construction of a boiler plant to cost $1,000,000 at its newsprint mill here. Contract for boilers has been placed with Canadian Vickers Ltd., Maisonneuve, Montreal, Que.

HULL, QUE.—Hydraulic Jack Co., Sherman, N. Y., is understood to plan construction of a plant here. R. W. Helmar is president.

MONTREAL, QUE.—Western Steel Products, Desautels street, St. Boniface, Man., maker of fireproof windows and doors, has purchased George W. Reed & Co., 779 St. Antoine street, here, the plant of which is included in the Montreal terminal scheme. A new plant is said to be planned on Cathcart street at an estimated cost of $500,000.

PENETANGUISHENE, ONT.—Dominion Stove & Foundry Co. Ltd., manufacturer of stoves and ranges, is reported planning construction of a plant to cost about $100,000.

Recent Incorporations

CHICAGO—Henry Ernst Mfg. Co. has been incorporated with $5000 capital by Henry Ernst, 180 North Wacker drive, to deal in iron, steel and brass.

CHICAGO—Metal Mouldings Inc. has been incorporated with $10,000 capital by Herman Wagner, 105 North Clark street, to deal in sheet metal and sheet work of all kinds.

DETROIT—United States Fixture Mfg. Co. has been incorporated with $25,000 capital by Max Bennish, 602 East Congress street, to manufacture and deal in retail store fixtures and equipment.

DETROIT—William Darkwood Co. has been incorporated with $10,000 capital by the company, 1009 Franklin street, to engage in general manufacturing and the manufacture of screw machine products.

DETROIT—Electric Die Forging Co. has been incorporated with $100,000 capital by John A. Nichols, care Durant Motors Inc., 5057 Woodward avenue, to manufacture, sell and deal in forgings and foundry products.

LANSING, MICH.—Capital City Heating Service Inc. has been incorporated with $3000 capital by Joseph Schmit, 2600 South Cedar street, to engage in general furnace and sheet metal work.

CARTHAGE, MO.—Carthage Foundry & Machine Co. has been incorporated with $30,000 capital by Nellie B. Moore.

ASHEVILLE, N. C.—S. Sternberg & Co. has been incorporated with $125,000 capital stock by J. R. Sternberg to deal in iron, scrap and junk.

ATLANTIC CITY, N. J.—Heinen Aircraft Corp. has been incorporated with 1000 common shares by Glenn & Glenn, attorneys, Guardian Trust building, to build airplanes.

ELIZABETH, N. J.—Oneida Mfg. Co. has been incorporated with $50,000 capital by Salvatore F. LaCorte, attorney, 95 Broad street, to engage in general manufacturing.

JERSEY CITY, N. J.—Claremont Equipment Corp. has been incorporated with 250 shares of common stock by Merrill, Rogers, Gifford & Woody, attorneys, 60 Broadway, New York, to deal in machinery.

NEWARK, N. J.—Jenson & Mitchell Inc. has been incorporated with $250,000 capital by Howard Isherwood, attorney, 738 Broad street, to manufacture springs.

UNION CITY, N. J.—Frank Manning Equipment Co. has been incorporated with $100,000 capital by Leuly & Moser, attorneys, Bline avenue, to manufacture tools.

BROOKLYN, N. Y.—Weliken Copper & Machine Works has been incorporated with $20,000 capital by W. Sullivan, 160 Broadway, New York.

NEW YORK—Elk Bearing Equipment Corp. has been incorporated with $20,000 capital by S. Nattison, 61 Broadway, to operate a machine shop.

OKLAHOMA CITY, OKLA.—Bi-Steel Carburizer Co. has been incorporated with $25,000 capital by F. A. DeMand, Colcord building, to manufacture automobile accessories.

SHAWNEE, OKLA.—R-F Electrical Mfg. Co. has been incorporated with $67,000 capital by Charles E. Bowlby, to manufacture electrical specialties for oil fields.

TULSA, OKLA.—Mid-Continent Engineering & Construction Co. has been incorporated with $25,000 capital by C. M. Powell, Atco building, to design and erect steel derricks and rigs.

CHARLEROI, PA.—Asphalted Metal Co. has been incorporated with $20,000 capital by Garett E. Wagner, 436 Oakland avenue, to manufacture and sell asphalted metal products.

PHILADELPHIA—Clarke Can Co. has been incorporated with $350,000 capital by James A. Clarke, 6151 Catherine street, to design, manufacture and sell tin cans and containers.

PHILADELPHIA—Hyatt & Co. has been incorporated with $50,000 capital by George F. Kessler, 5533 Florence avenue, to manufacture

in tin, metals, heating and roofing materials.

PHILADELPHIA—Gibb Machine Corp. has been incorporated with $5000 capital by David H. H. Felix, 1416 South Penn square, to manufacture and sell knitting machinery.

PHILADELPHIA—Southwark Smelting & Refining Co. Inc. has been incorporated with 400 no par shares by Dorothy E. Morgan, 5304 Chew street, to engage in smelting, refining, manufacturing and selling all ores and metals and their products.

PHILADELPHIA—T. J. Cope Inc. has been incorporated with $50,000 capital stock by William H. Govett, Aldan, Pa., to manufacture and deal in tools, implements and appliances used in connection with the electrical, mechanical and construction industries.

PITTSBURGH—Montgomery-Lamer Steel Co. has been incorporated with $25,000 capital by Lilias Elliott, 1317 Oregon avenue, Steubenville, O., to manufacture and sell metal-working machinery, to cast, forge and fabricate structural steel and metal products.

PITTSBURGH—American Equipment Corp. has been incorporated with 100 no par shares by Miles H. England, 1025 Union Trust building, to manufacture and deal in bolts, nuts, screws and rivets.

PITTSBURGH—Point Spring Co. has been incorporated with 100 no par shares by E. C. McHugh, 747 Union Trust building, to manufacture and deal in iron and steel and their products.

PITTSBURGH—Steel Car Forge Corp. has been incorporated with $100,000 capital by G. D. Patterson, 38 South Dearborn street, Chicago, to manufacture in iron and steel, metal products of every description, machinery, and other metal products.

SCHUYLKILL HAVEN, PA.—Losch Automatic Furnace Co. has been incorporated by Cyrenius Losch to manufacture and sell stoves, furnaces, radiators, heating systems and machinery used in connection therewith.

STROUDSBURG, PA.—Niagara Steel Wire Corp. has been incorporated with 2000 no par shares by C. H. Rhodes, to manufacture iron and steel wire, bars, plates and other iron and steel products.

AMARILLO, TEX.—Leatherless Plunger Pump Corp. has been incorporated with 250,000 no par shares by J. M. Sheers, Oliver-Eakle building, to manufacture a special pump for oil fields.

BORGER, TEX.—Neill & Sons Boiler Works has been incorporated with $5000 capital by Clyde B. Neill to manufacture and repair oil field boilers.

FORT WORTH, TEX.—Acme Salvage Co. has been incorporated with $20,000 capital by N. Eron, 320 Worth building, to deal in oil field salvage and pipe.

DANVILLE, VA.—Danville Welding Co. has been incorporated with $25,000 capital by Maitland H. Bustard to operate a general machine shop and welding works.

CEREDO, W. VA.—Mid-West Iron Works has been incorporated with $25,000 capital by H. J. Stark and G. B. DeVries.

CHARLESTON, W. VA.—Virginia Tool & Mfg. Co. has been incorporated with $25,000 capital by N. E. Marquis, 1535 Springhill drive, to manufacture tools.

McMECHEN, W. VA.—Wheeling Tube Co. has been incorporated by A. W. Laas, attorney, Riffey Law building, to manufacture seamless tubing.

PRESTON, ONT.—Steel Shank & Specialty Co. Ltd. has been incorporated with $100,000 capital stock by Henry W. Steel and Harry C. Edgar to manufacture and deal in wooden, steel and composition shanks for the manufacture of shoes.

TORONTO, ONT.—Kari-Keen & Auto Trunks Ltd. has been incorporated with $50,000 capital stock and 7000 no par shares by Ivan C. Harries, attorney, 36 Toronto street, to manufacture and deal in accessories for automobiles and trucks.

TORONTO, ONT.—Farm Vehicles Ltd. has been incorporated with $300,000 capital stock by Charles E. Abram, 23 Seaforth street, to manufacture and deal in spring wheels, wagons and trucks.

MONTREAL, QUE.—Turner Construction Co. of Canada Ltd. has been incorporated by Kenneth Archibald, 16 Parkside place.

MONTREAL, QUE.—Automatic Health Machine Corp. Ltd. has been incorporated with 50,000 no par shares by Maurice Shulman, attorney, 276 St. James street, to manufacture and deal in automatic health machines.

SHERBROOKE, QUE.—Sherbrooke Machines Ltd. has been incorporated with $240,000 capital stock and 2400 no par shares by Frederick S. Rugg and Bartley N. Holtham, to carry on the business of mechanical engineer and metal worker.

New Trade Publications

MOLD COATING—Vulcan Mold & Engineering Co., Latrobe, Pa., presents in a bulletin the claims for its mold-coating material and devices for applying it to the interior of molds.

SPEED REGULATORS—Reeves Pulley Co., Columbus, Ind., has issued a leaflet on its variable-speed transmission, showing adaptation to various types of installation.

BORING MACHINES—Automatic Machine Tool Co., Bridgeport, Conn., has issued four loose-leaf bulletins for inclusion in its catalog binder, showing four new applications of its diamond tool boring machines.

MATERIAL HANDLING—Truscon Steel Co., pressed steel division, Youngstown, O., has issued a folder on its trucks, boxes and skid platform for economical handling of industrial materials, illustrated.

SHEET METAL TOOLS—Niagara Machine & Tool Works, Buffalo, N. Y., in a current bulletin describes its No. 1 series of inclinable open-back presses for sheet metal forming. The presses and construction details are illustrated.

SPEED REDUCERS — Cullman Wheel Co., Chicago, describes in a bulletin four sizes of its single-type speed reducers and three sizes of double-type with ratios of reduction for each size. Typical installations are shown.

WATER TUBE BOILERS—James T. Castle, Pittsburgh, merchant engineer, is distributing a catalog of the Union Iron Works, Erie, Pa., covering its longitudinal drum water tube boilers. Details of construction are given and numerous installations are illustrated.

AIRCRAFT TUBING—A contribution to aeronautics is presented by the Summerill Tubing Co., Bridgeport, Pa., in a booklet of data relating to aircraft tubing. It covers physical properties, chemical compositions, heat-tested tubing, weights, making and testing, and standard and special shapes.

ELECTRO-CHEMICAL CLEANING—Bullard-Dunn Process division of the Bullard Co., Bridgeport, Conn., in a current bulletin gives a description of its electro-chemical cleaning process for removal of scale, oxides and other foreign matter from the surface of metals without pitting, etching or hydrogen embrittlement.

GAS PUMPS—P. H. & F. M. Roots Co., Connersville, Ind., has issued two folders describing advantages and illustrating features and construction of its heavy and standard duty, roller-bearing gas pumps. The bulletins feature a half-section view of the machines giving details of construction.

PRECISION LATHES—South Bend Lathe Works, South Bend, Ind., has completed a new catalog covering its 96 sizes and types of precision lathes, with their tools and attachments. Included in the line is a metric lathe built to cut international and French standard metric screw threads of standard pitches.

STEAM JET HEATERS—A revised bulletin on its steam jet heaters for liquids has been issued by the Schutte & Koerting Co., Philadelphia. These heaters are available for industrial plants requiring hot water for washing or the heating of special liquids for process work.

CONVEYORS—Anchor Steel & Engineering Co., Detroit, has issued a pamphlet describing and illustrating uses of its overhead conveyors. The information includes the solution of a typical overhead conveyor problem, conveyor system layout, table showing chain pull, conveyor drives, data for curves, care and adjustment of units and description of parts.

STEEL TANKS—Standardization of steel oil and gas tanks of all sizes, adopted years ago by the Riter-Conley works of the McClintic-Marshall Co., Pittsburgh, is made the subject of a bulletin by that company. It is devoted to presentation of representative installations which were designed and fabricated by this organization.

VENTILATION—Coppus Engineering Corp., Worcester, Mass., has compressed into a small bulletin much information on ventilation by use of its units to provide free circulation, render breathing easier and improve efficiency of workers in places where heat tends to become excessive. Illustrations portray the devices for elimination of heated, stagnant air.

CO_2 METERS—Leeds & Northrup Co., Philadelphia, is circulating a bulletin on its CO_2 electrical meters. It covers control of combustion, relation of the gas to excess air, effects of hydrogen on fuel, excess air and flue-gas temperature, loss due to excess air and describes the meter and its application. A catalog of the meters and accessories is included.

LOCOMOTIVES—Mine and industrial locomotives manufactured by the Baldwin Locomotive Works, Philadelphia, and the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., are described in detail in a special bulletin issued jointly by these companies. Each type is illustrated, specifications are given and a blueprint shows two sectional views.

STEEL BARGES — Various styles of steel barges built by the McClintic-Marshall Co., Pittsburgh, for river transportation, are illustrated in a bulletin by that company. Growth of transportation service on the Mississippi and Ohio rivers has made this type of craft an important factor, in which this company has specialized.

Pipe and Tube Prices—Plate Extras

Steel Pipe

(Base price $200 per ton)

Pittsburgh and Lorain basing discounts, jobber's carloads.

Evanston, Ill., and Indiana Harbor, Ind., take differential 2 points less discount.

Chicago takes differential 2½ points less than Pittsburgh-Lorain basis.

Butt Weld

	Black	Galvanized
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½

Lap Weld

2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½

REAMED AND DRIFTED

Butt Weld

1 to 3-inch	60	48½

Lap Weld

2-inch	53	41½
2½ to 6-inch	57	45½

EXTRA STRONG—PLAIN ENDS

Butt Weld

⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½

Lap Weld

2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½

DOUBLE EXTRA STRONG

Butt Weld

½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½

To large jobbers these discounts are increased by 1 point and two supplementary discounts of 5 per cent on black, and 1½ points and two supplementary discounts of 5 per cent on galvanized.

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers' carloads. Individual quotations made on delivered basis.

THREADS AND COUPLINGS

Butt Weld

	Black	Galv.
¼ and ⅜-inch	+11	+36
½-inch	23	5
¾-inch	28	11
1 and 1¼-inch	31	15
1½ and 2-inch	35	18

Lap Weld

1¼ and 1½-inch	Upon application	
2-inch	23	9
2½ to 3½-inch	28	12
4 to 6-inch	30	17
7 and 8-inch	29	16
9 to 12-inch	26	11

REAMED AND DRIFTED

2-inch to 6-inch—Two points less than above

EXTRA STRONG, PLAIN ENDS

¼ and ⅜-inch	+13	+48
½-inch	23	7
¾-inch	28	12
1to 2-inch	34	18

Lap Weld

2-inch	29	13
2½ to 4-inch	34	20
4½ to 6-inch	33	19
7 and 8-inch	31	17
9 to 12-inch	21	8

DOUBLE EXTRA STRONG

Butt Weld

½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39

Lap Weld

2 and 2½-inch	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	.....

Jobbers obtain additional preferential discounts of 1, 5 and 2½ on black and galvanized wrought iron pipe.

On extra or double extra strong pipe fitted with threads and couplings basing discount lowered 5 points from plain end price. Fitted with threads only, basing discount lowered 3 points for random lengths.

Boiler Tubes

Pittsburgh carload discounts

STEEL (Lap Weld)

2 and 2¼-inch	38 off
2½ and 2¾-inch	46 off
3-inch	52 off
3¼ to 3¾-inch	54 off
4-inch	57 off
4½ to 6-inch	46 off

Subject to two 5 per cent discounts on full carload shipments. On less than 10,000 pounds, base discount reduced 6 points and one 5 per cent allowed. Over 10,000 pounds to carload, base discount reduced 4 points and two 5 per cents allowed.

CHARCOAL IRON

1½-inch	1 off
1¾-inch	8 off
2 and 2¼-inch	13 off
2½ and 2¾-inch	16 off
3-inch	17 off
3¼ to 3½-inch	18 off
4-inch	20 off
4½-inch	21 off

Subject to 10 per cent discount on full carload lots. On less than 10,000 pounds, base discount reduced 2 points and no preferential allowed. On 10,000 pounds to carload, 5 per cent preferential allowed.

SEAMLESS COLD DRAWN

1-inch	61 off
1¼ and 1½-inch	53 off
1¾-inch	37 off
2 and 2¼-inch	32 off
2½ and 2¾-inch	40 off
3-inch	46 off
3¼ and 3½-inch	48 off
4-inch	51 off
4½, 5 and 6-inch	40 off

SEAMLESS HOT ROLLED

1¾-inch	37 off
2 and 2¼-inch	38 off
2½ and 2¾-inch	46 off
3-inch	52 off
3¼ and 3½-inch	54 off
4-inch	57 off
4½, 5 and 6-inch	46 off

Subject to 5 per cent supplementary discount for carload lots. On less than 10,000 pounds, base discount reduced 6 points. On 10,000 pounds to carload, base discount reduced 4 points and one 5 per cent allowed.

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts on New List July 1, 1925

Carbon 0.10 to 0.30 per cent.....55 to 55 off

Carbon 0.30 to 0.40 per cent.....45 to 50 off

Plus usual extras for forming and for long lengths over 18 feet and for commercially exact lengths.

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Net price per foot f.o.b. Pittsburgh

Outside diameter	Gage	Price
2-inch	12-gage	14¼c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	12-gage	16c
2¼-inch	11-gage	17c
2¼-inch	10-gage	18c
3-inch	7-gage	33c
5⅝-inch	9-gage	50c
5½-inch	9-gage	52c

Plus usual extras for forming and for lengths over 24 feet.

Plate Extras

BASE

Rectangular plates, tank steel or conforming to manufacturers' Standard Specifications for structural steel, date Nov. 24, 1922, or equivalent, ¼-inch thick and over on thinnest edge (except for ¼-inch or 72 inches wide when ordered to weight in pounds per square foot—see width and gage extras), 100 inches wide and under, down to but not including 6 inches wide, 5 feet 0 inch long up to published limit in length but not over 80 feet 0 inch, are base. Extras per pound for width or diameter.

All Plates Rectangular or Otherwise

¼-inch thick and heavier, but not less than 11 pounds per square foot, if ordered to weight.

Over 100 to and including 110 inches	.05c
Over 110 to and including 115 inches	.10c
Over 115 to and including 120 inches	.15c
Over 120 to and including 125 inches	.25c
Over 125 to and including 128 inches	.50c

Plates less than ¼-inch or lighter than 11 pounds per square foot.

Over 72 to and including 84 inches	.10c
Over 84 to and including 96 inches	.20c
Over 96 to and including 100 inches	.30c

Over 100 inches add .35c to width extras for plates ¼-inch thick and heavier.

GAGE

Plates Not Exceeding 72 Inches Wide

Plates less than ¼-inch gage, to and including 3/16-inch; or lighter than 10.2 pounds per square foot, to and including 7.65 pounds square foot..... .20c

Plates Over 72 Inches Wide

Plates less than ¼-inch gage, to and including 3/16-inch; or lighter than 11 pounds per square foot to but not including 7.65 pounds square foot.... .20c

Plates ordered 7.65 pounds square foot .30c

QUALITIES

Pressing steel	.10c
Flange steel (boiler grade)	.15c
Ordinary firebox steel	.20c
Stillbottom steel	.30c
Locomotive firebox steel	.50c
Marine steel	1.50c
Hull materials subject to U. S. Navy Dept. specifications for medium or soft steel	.10c
High tensile hull steel subject to U. S. navy department or equivalent specifications	1.00c
Boiler steel subject to U. S. navy department specifications, class A-B..	1.50c

Hull plates to hull specifications, required to stand cold flanging, take extra for flange steel.

Floor Plates

Checkered plates 1.75c

Checkered plates are not furnished to sketch and are rolled from "Stock Steel" only. No physical tests will be made on checkered plates.

INSPECTION

Mill inspection ..... No extra

Charges for other inspection, such as Lloyd's or American bureau of shipping, will be made by inspection bureau direct to buyer.

CUTTING

LENGTH OR DIAMETER

All Plates, Rectangular or Otherwise

Five feet and over up to published limit of length, but not over 80 feet.....No extra

Under 5 feet to 3 feet inclusive	.10c
Under 3 feet to 2 feet inclusive	.25c
Under 2 feet to 1 foot inclusive	.50c
Under 1 foot	1.55c
Over 80 feet to 100 feet inclusive	.10c

Over 100 feet add .25c plus .05c for every additional 2 feet or fraction thereof.

Regular Sketches

With not more than four straight cuts (Including straight taper plates)

Additional extra ..... .10c

Irregular Sketches

With not more than four straight cuts. (Sketches cannot be sheared with re-entrant angles)

Additional extra ..... .20c